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THE NEW YORK ASSOCIATION

The New York State Association has followed the example of the American Association by changing the words "Street Railway" in its title to "Electric Railway." Neither of these associations, however, was as early in its use of the more comprehensive title as the Central Electric Railway Association. When the New York association began the period of three decades which it has just ended, the membership, of course, was composed of the street railways which furnished the local transportation facilities at that time. The same underlying reasons which led to the change of name of the national organization to the American Electric Railway Association and to the similar change in the title of this publication from STREET RAILWAY JOURNAL to ELECTRIC RAILWAY JOURNAL are effective also in the case of the New York association. The field of activity and future effort before the New York association is one that is certain to broaden widely. Besides the extension of membership from the purely street railway system of early days to the interurban lines of the present time, it should expand so as to enlist the electrified steam railroads in its useful work. By reason of its large membership and its continued insistence upon better operating methods, the New York association has been of great value to the industry, and the achievements of the past years encourage it to further development and improvement in the future.

THE SARATOGA CONVENTION

During the successful annual convention which was held this week at Saratoga Springs the main subject of general discussion was accident prevention. Following the same method which has been found at previous meetings to evoke the broadest discussion and to present all aspects of a subject, this topic was considered from several different standpoints. Prepared papers were read in which the wisdom of prevention and the need of painstaking methods if improvement is to be effected were urged. These dealt with the subject from the standpoint of the attorney, the claim agent and the operating official. They were supplemented by oral discussions in which the dangers of lax methods were considered from the additional standpoints of the medical examiner and the effect upon the financial results from operation. Each company has its own means of dealing with this problem, and the fact that so many different policies are adopted invites the attention of the American Electric Railway Claim Agents' Association, which could do no work of greater importance to the industry than through standardization that would help to relieve the companies of the great burden of expense which they meet. If an avenue of disbursement in any other department should show such serious increases in its relation to gross operating revenue as that developed in the cost of injuries and damages, it would be subjected to the most searching kind of detailed analysis. The causes of accidents lead so far into the operating department that improvement can result only from the hearty co-operation

of the branches of the service concerned. Many of the suggestions which are found in the discussion published elsewhere in this issue are applicable to properties generally and it is to be hoped that the proceedings before the New York association will bear fruit not only in this State but also in other localities where this part of the expense of operation is so serious as to invite disaster.

AUTOMATIC BRAKE ADJUSTMENT

The question of automatic slack adjustment in brake equipment has of late become pertinent not only in its relation to economies in car maintenance but in the savings that result from its employment in reducing energy consumption and accidents. Practical automatic slack adjusters have been on the market for a number of years, but recent improvements in the design and operation of the different types have located them at a point in the brake equipment where they are really efficient. The inability of ordinary carhouse labor to use proper judgment in adjusting brakes is a well-known fact, and it is not infrequent to find brakes set up as tight as will permit the car to run under power, with the result that the car will stop as soon as current is shut off. This condition is all right from the motorman's standpoint, but the cost of operation per car mile increases enormously, current consumption is doubled and the life of the equipment in many cases is reduced one-half, owing to wear on wheels and brakeshoes, as well as overloaded motors, gears and pinions. The motorman, in fact, may even be unable to maintain his schedule under such conditions. In general, the importance of accurate adjustment of slack in brake equipment does not appear to receive due consideration, although in most cases electric railways, unlike steam roads, operate single-car trains wholly dependent on a single brake equipment. Inattention to taking up the slack accurately in the brake rigging on all cars in regular service, or at least inspecting or testing the brake equipment daily to determine its ability properly to respond to applications, may result in a loss of life and property that would pay for automatic slack adjusters several times over.

BROOKLYN SUBWAY FINANCING

Plans announced by the Brooklyn Rapid Transit System for financing its part of the cost of the new subway development in Greater New York are somewhat different in their detail provisions from the arrangements of the Interborough Rapid Transit Company, which were discussed in the Electric Railway Journal of June 1, 1912. However, the Brooklyn plans may work out so as to be in fact very similar to those of the Interborough company. The Brooklyn scheme of financing rests upon a present issue of $40,000,000 out of a total of $60,000,000 authorized six-year 5 per cent notes. These have been sold outright to the syndicate subscribers at a price of 96.65. As the syndicate subscribers are not bound in any way in the transaction to hold their securities for a definite term or price, they will undoubtedly offer the notes on the market when and as opportunity and the price warrant. The notes are to be secured by a deposit of $10,000,000 Brooklyn Rapid Transit Company convertible 4 per cent refunding bonds and $40,000,000 first mortgage sinking fund 5 per cent bonds of a new subway subsidiary company. As an invitation to the buyers to regard the financing as permanent instead of temporary, the notes are convertible into the new first mortgage bonds until Jan. 1, 1916. As in the Interborough case, this transaction is contingent only upon the approval by the Court of Appeals of the preferential payment plan, upon which the entire contract between the city and the company rests. As surplus earnings of the Brooklyn Rapid Transit System show a balance which T. S. Williams, the president, estimates will be equal in the year ended June 30, 1912, to twice the interest on the new notes, and as the interest on the new securities is a construction charge until the improvement is completed, the securities found a ready market. In view of the issue of large amounts of obligations of the Brooklyn and Interborough companies at one time, secured on property of the same kind, it is good judgment to differentiate a little the terms of the investments in order that different classes of buyers may be attracted.

BOILER FURNACE BAFFLES

That there must be a surplus of air present in order to produce reasonably efficient combustion of coal in a boiler furnace is a well-established fact, as is also the difficulty of supplying air in accordance with the exact requirements over each square inch of a grate having an area of perhaps 100 sq. ft. and carrying a fire ranging from 6 in. to 12 in. in thickness. If the chimney draft or the blast under the grate is sufficient to force a supply of air through the interstices between the lumps of coal in the thick portions of the fire in just the correct quantity, the blast pressure will manifestly be much greater than necessary at the thin portions. An absolutely even air supply is a physical impossibility, for, even if the surface of the fire is kept by some unusual means as level as the proverbial billiard table, the very nature of the material which makes up a coal fire prohibits any possibility of exact uniformity in the innumerable passages for the air through the fuel bed. These air passages, formed by connecting spaces which exist between the irregular lumps of coal, are further influenced in their effectiveness by the layer of ash and clinker on the grate below the fire.

This non-uniformity of air supply over the entire grate area gives rise occasionally to extraordinary results. The paradox of a test showing that a fire which as a whole is supplied with actually less than the theoretical requirement of air can deliver flue gas, or products of combustion, containing quite a high percentage of free oxygen is due to this cause. Of course such an absurd condition is unusual. It may, in fact, be regarded by some as impossible, yet the locomotive boilers tested at the stationary plant at the Louisiana Purchase Exposition showed a number of instances where this condition existed.

Manifestly, if free oxygen can exist after passing through a fire which in some places is getting less than the proper supply of air, with the consequent formation of carbon monoxide and unburned hydro-carbons, and it is impossible to avoid this condition by producing an even flow of air over the entire grate area, it would appear that a serious loss is certain to occur regardless of the pro-

cedure followed. If the air supply is decreased, in order to reduce the free oxygen, the incomplete combustion in parts of the fire will be emphasized. If the air supply is increased to the point where no carbon monoxide is formed, the free oxygen with its accompanying nitrogen from the air will be increased so much as to cause a serious loss because it will add greatly to the amount of heat which is wasted up the chimney.

These facts have been accepted for some time by specialists in steam boiler construction and operation and from time to time efforts have been made to overcome the difficulty either by bringing the free oxygen into contact with the carbon monoxide above the fire and thus burning it, or else by introducing fresh air into the furnace for the same purpose. In either case the necessity for violent agitation and close intermingling of the streams of gas has been generally recognized. The so-called "wing-wall" furnace is an example. In fact, one steam user in Chicago carried out the idea of intermingling or "mixing" the products of combustion to such an elaborate extent as to produce a practically smokeless hand-fired furnace.

In all such arrangements, however, it has not necessarily followed that the "mixing" of the gases has been accomplished in a logical or even a common-sense manner. Combustion chambers and even complicated baffling arrangements are sometimes located at points in a boiler where the temperature is so low that there is no possibility for the free oxygen to unite chemically with the carbon monoxide after the two are brought into contact. After the ignition point has been passed, any attempt to mix the products of combustion might just as well be carried on in the chimney. It is, unfortunately, not at all uncommon to find types of boilers in which the "combustion chamber" is pointed out as an important feature, notwithstanding the fact that the products of combustion have to pass over a considerable portion of the heating surface before reaching it. It is possibly not generally appreciated that the passage through the first 20 per cent of the boiler reduces the temperature of the products of combustion to such a low point that the tendency for any free oxygen to unite with combustible gas which may exist is seriously retarded if not altogether prohibited.

The admission of fresh air to the furnace above the fire has been tried many times and under many conditions. The results of most of the experiments indicate that it is an expedient of doubtful value, although in some quarters it is believed to be an aid to the reduction of smoke. From a strictly technical standpoint the practice is illogical, as furnace temperatures to-day are hardly high enough to stand the chilling effect of a large amount of cold air, and it has never been satisfactorily demonstrated that oxygen contained in fresh air has any more ability to combine with carbon monoxide than the free oxygen existing in the products of combustion.

Generally speaking, any arrangement of baffles in the actual furnace of a steam boiler introduced for the purpose of mixing the furnace gases will produce results which more than compensate for the slightly increased draft which their presence necessitates. If they isolate the combustion space from the radio-absorbing effect of the boiler plates or tubes, the conditions will be still better, but when any opportunity exists for chilling the gases, either by a preliminary passage through the boiler or by making the baffles as a part of the boiler itself, their value is exceedingly doubtful.

COLLAPSE OF THE BOSTON STRIKE

The collapse of the recent strike of less than one-third of the car service employees of the Boston Elevated Railway Company marks the defeat of a carefully planned effort on the part of irresponsible labor-union agitators from outside Massachusetts to subvert the management of a company generally admitted to be surpassed by none in the world in the fairness and humanity of its administration. The walkout, which took place on June 7, without the slightest evidence of sane consideration on the part of the disaffected minority, was doomed to failure from the start, and with the exception of a somewhat reduced service during the first week of trouble, the public of Greater Boston has suffered but little inconvenience. The justice of the company's position that it could not for a moment consider dealing with necessarily irresponsible outsiders in its relations with its employees was generally recognized, and the ability and frankness with which the executive officers took the public into their confidence, combined with immediate and vigorous action by the police and the courts in all cases of violence and disorder, brought the situation into complete control within a few days of the rupture. To-day there is not the slightest evidence that a strike was called early in the month, either in the volume of traffic or in the general quality of the service.

There is no question that the liberal treatment of its employees by the company for many years past was recognized by the Boston public and that it was a powerful influence toward the formation of the favorable opinion of the management felt by the public. Comments to this effect were overheard on every car during the late walkout. Undoubtedly also this broad-minded policy on the part of the company was equally recognized and appreciated by the men, especially by those who had been some time in the service and thus had had experience with it. Many letters were received both by the company and the daily papers from employees expressing the strongest loyalty to the company and appreciation for previous acts of sympathy and kindness to themselves or to their families, and a number of these letters appeared in print. The fact was also generally recognized that although the company had not raised its dividend rate and had assumed enormous burdens for rapid transit facilities and development, it had four times since 1902 raised wages, so that, as stated in a recent issue, the highest wages which a man receives now are more than 30 per cent higher than the rate of ten years ago.

The experience of the last three weeks in Boston has definitely shown that no grievance exists between the great body of its loyal employees and the company, and in its adherence to the management and rejection of the overtures of agitation, the far greater part of the operating organization has demonstrated its common sense and far-sighted realization of the favorable conditions that had long maintained the Boston system in the front rank of the world's urban transportation organizations.

The New Nicollet Avenue Carhouse of the Twin City Rapid Transit Company

A Description of a Modern Fireproof Carhouse and Storage Yard with Commodious Trainmen's Club Rooms—The Building Is Equipped with Novel Carhouse Entrance Doors and Trolley Construction

The Twin City Rapid Transit Company, of Minneapolis, Minn., has recently put its new Nicollet Avenue carhouse and storage yard in service. The new station and yards occupy the site of the old general repair shop on Nicollet Avenue between Thirty-first and Thirty-second Streets. Before work on the new station could be started it was necessary to remove a large portion of the old shop buildings and tracks. Ingress and egress to the new station are from the north and south, and the entrance to the old shop and yards was from the east, or Nicollet Avenue, thus the new and old layouts intersected at right angles.

The new station and yards will provide storage space for 200 cars, and all cars operating on the Washburn Park and Columbia Heights, Fourth Avenue South and Sixth Avenue North and the Monroe and Bryant lines will be stored at this point. The carhouse occupies the northeast corner of the property and consists of a three-track bay storage shed and a two-story and basement section. This two-story section is used for trainmen's club rooms, transfer office, headquarters for the underground cable department and for the storage of running repair parts. The storage yard occupies the remainder of the vacated property and consists of six house tracks which have 90 ft. of outside storage space at the Thirty-first Street end of the property and 190 ft. at the Thirty-second Street end, two 190-ft. stub tracks leading up to the south end of the carhouse, one of which is depressed and enters the basement of the building, eight tracks 598 ft. long extending the full length of the property, four stub storage tracks at the south of the old boiler room 200 ft. long, and a depressed cinder-loading track at the north of the boiler room.

Minneapolis Carhouse—General View of Building and Storage Yard

TRACK LAYOUT AND OVERHEAD

As shown on the general plan, the track layout was designed so that cars may leave the storage yard from either the Thirty-first or the Thirty-second Street end headed in any decided direction. The ladder construction, which provides leads to three storage tracks spaced at 12-ft. centers through one branch-off from the main ladder track, was designed with a view to reduce the number of turnouts in the main ladder and at the same time to obtain a maximum storage space on the yard tracks. The track approaches to both the yard and the carhouse have been paved with brick between the station building line and street curb line. The yard tracks have been brought to a uniform elevation, and the entire yard has been covered with a gravel surface even with the tops of the rails.

Span-wire construction carried from tubular steel poles supports the overhead trolley lines. The overhead was constructed so as to leave the storage yards as free from poles as possible. The yard is illuminated at night by arc lamps mounted on brackets which have been clamped to the tops of the trolley poles.

The carhouse was built 90 ft. 6 in. back from the building line on Thirty-first Street, and the space directly in front of the two-story section of the building will be parked. Wide concrete walks have been constructed on the three sides of the property and leading up to the entrances of the two-story section of the building.

CARHOUSE CONSTRUCTION DETAILS

The building has been made fireproof throughout, being constructed on concrete foundations with reinforced concrete columns, floor systems, floors and roof slabs. The roof over the carhouse bays is supported on structural steel columns and trusses. The curtain walls are of brick and hollow tile. The general appearance of the building is pleasing, it being constructed of light-brown pressed brick laid in mortar colored to match. The trim around the windows, the belt courses and coping are of white unglazed terra cotta.

The car shed is divided into two bays 35 ft. 5 in. wide by 303 ft. long, and each contains three tracks which have concrete inspection pits extending their full length, as shown in the building plan. The car pit floors are convex, with 5-in. x 3-in. open drains on both sides. Provision has been made for heating the pits and carhouse by securely fastening steam-pipe coils to racks on the pit walls 1 ft. below the top of the rail. The open-pit drains are provided with outlets to sewers which pass transversely across the two bays. The pits are well lighted by lamps set in recesses in the pit walls. The floor between pits is a 3½-in. concrete slab, also convex in cross-section, and small open drains just outside the rails of each track, with grated outlets to the pit drainage system, are provided.

Seven-inch T-rail was employed as the running rail for

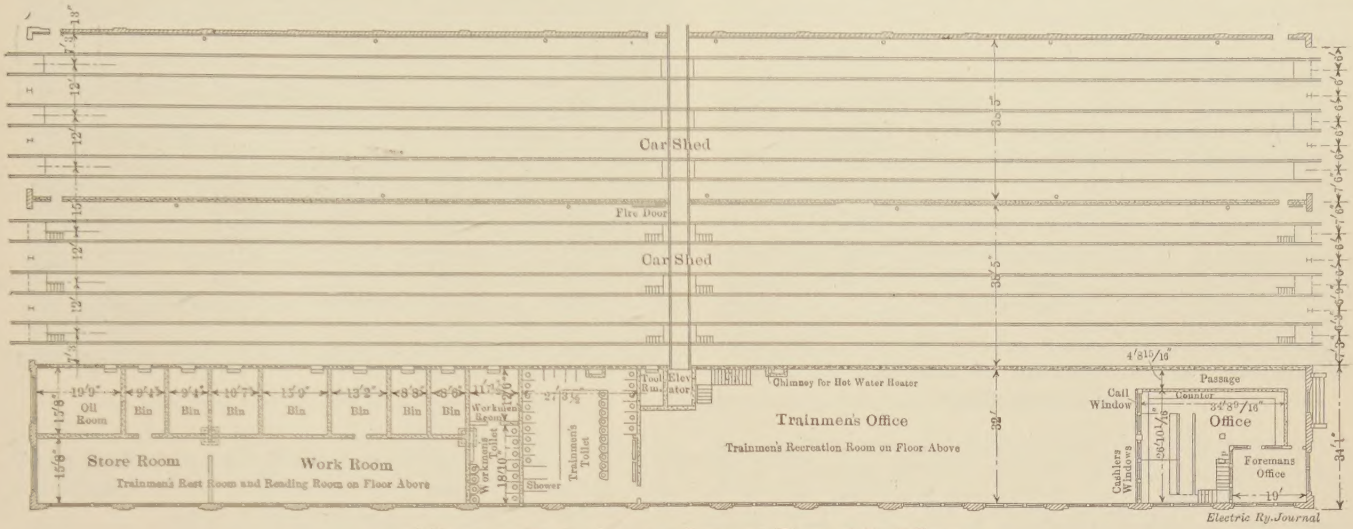
the pits, and this is anchored to the pit walls by two ¾-in. hook bolts which pass through holes in the base of the rail where a nut and rail clip have been applied. The rail anchor bolts are staggered at 4-ft. intervals. The inside bolt is 24 in. long, and the outside bolt is 36 in. long with a 4-in. hook on each.

The space between the track pits has been filled, but the arched concrete floor over this space was reinforced with ¾-in. x 7-ft. 3½-in. tie rods, which are spaced at 4 ft. intervals, and tie the pit walls of the adjoining pits together so that any tendency in the wall to overturn is checked and settlement in the filling will not crack the floor. Tie rods, ¾ in. x 5 ft. 8 in., spaced at 4-ft. intervals, tie the pit walls to the building-wall foundations.

The roof over the car sheds is a 3½-in.-concrete slab reinforced with American Steel & Wire Company's triangular mesh. It was designed to support a live load of 20 lb. per square foot of roof. The roof slab is carried on I-beam purlins which rest on the structural-steel roof trusses. The roof is covered with a five-ply tar-and-gravel roof coating. Roof drainage is provided by sloping the roof slightly from the center line of each bay, and the down spouts lead down along the inside of the building walls into the pit drainage system.

In order to reduce fire hazards the building wall between the storage yard and car shed was constructed without windows, and only four door openings were provided. The partition walls between the car-shed bays and the two-story section were provided with as few openings as practicable, and all have been protected with underwriters' specification fire doors.

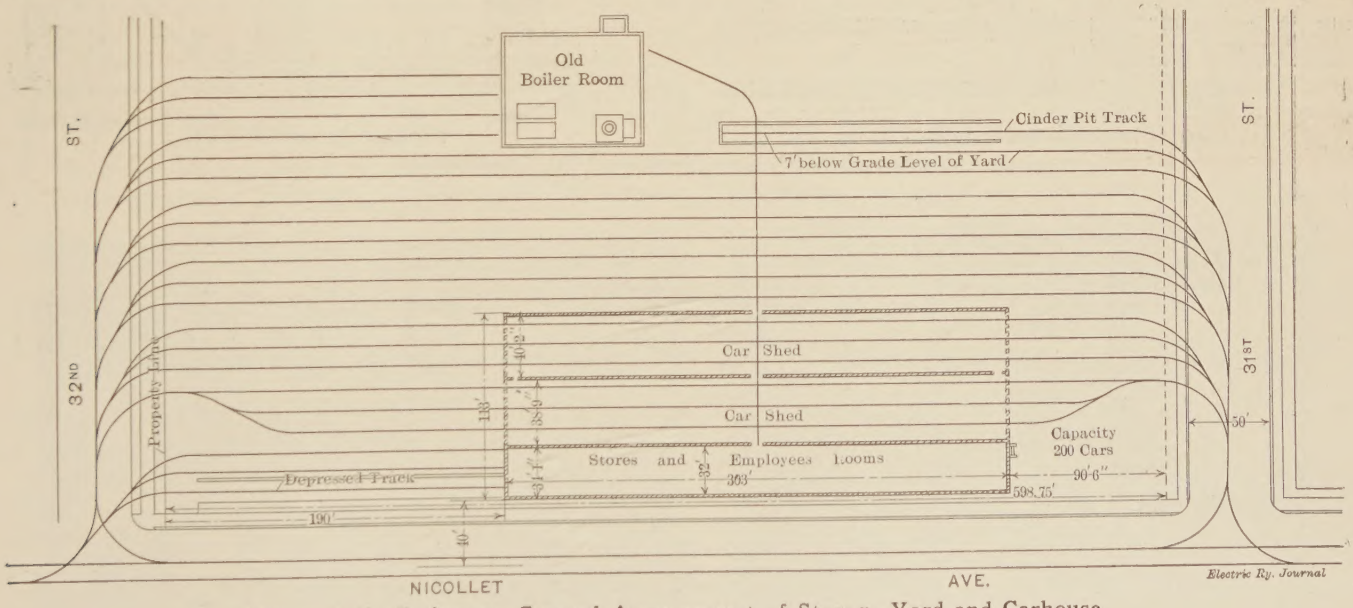
Since practically no daylight is furnished through the walls of the car-shed bays, it was necessary to supply twenty-four 6-ft. x 12-ft. skylights, spaced at 20-ft. intervals transversely with the car shed, and at 40-ft. intervals longitudinally. Transom sashes were provided over each of the car entrances. The skylights were designed especially for this carhouse and consist of an angle and T-bar frame on which rest sections of ribbed-wire glass, 6 ft. x 18 in. x ½ in. in size. The condensation drains are connected to the down spouts from the roof.



Minneapolis Carhouse—General Plan of Building

CARHOUSE DOOR DESIGN

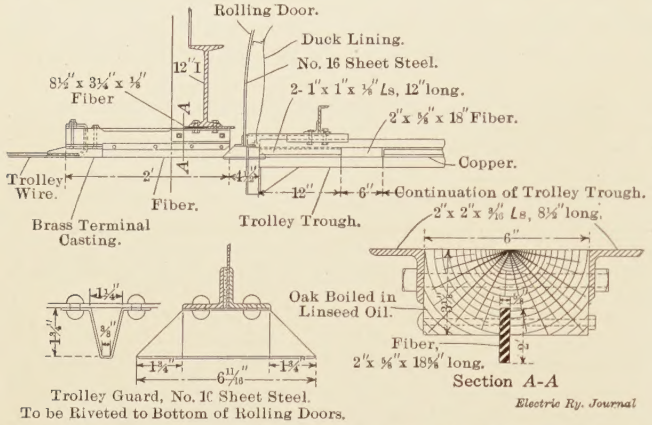
Probably the most novel feature in the entire carhouse construction will be found in the design of the car entrance doors and the trolley construction inside the carhouse. The door openings vary in width from 11 ft. 1½ in. to 12 ft. 8½ in., dependent on car clearances, and all are 17 ft. 8 in. in height. The construction details are shown in the illustrations. The novel features include a 16-gage continuous sheet-steel surface on the weather side of the door and a 4-lb. painted duck surface on the inside. The sheet steel is stiffened with 1½-in. x 1½-in. x ⅛-in. angles riveted horizontally to the sheet steel and spaced on 20-in. centers. An air space of 1½ in. is provided between the steel and



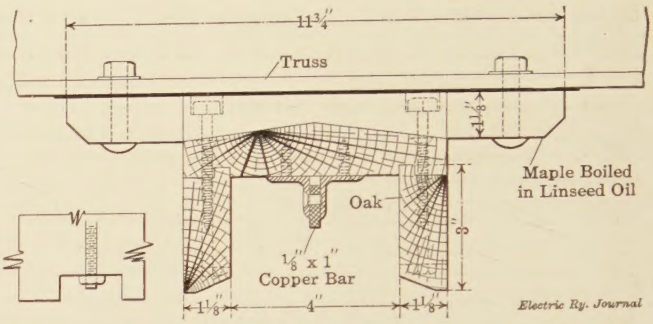
Minneapolis Carhouse—General Arrangement of Storage Yard and Carhouse

duck surfaces by riveting a ¾-in. x ¾-in. x ⅛-in. angle back to back with the stiffening angles and applying the duck to the small angle with stove bolts and washers.

In the design of the doors special care was taken that they should have a tight fit in the guides. This fact and the



Minneapolis Carhouse—Details of Overhead Construction at Rolling Doors



Minneapolis Carhouse—Details of Trolley Trough and Supports

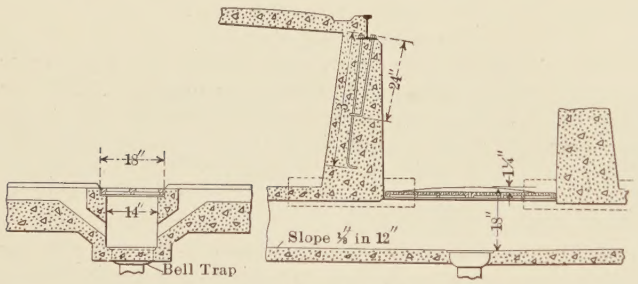
preservation of an air space between the steel and the canvas greatly improve the weather-resisting qualities of the doors. The door guides are formed by bolting two ¼-in. plates and a 7/16-in. separator to the walls and I-beam columns which form the entrances. The space between the sheet-steel weather surface which projects into the guide slots and the sides of the slot was weatherproofed by the application of two strips of ⅛-in. leather on the inside face of the metal, crimped to fill the guide slot.

The doors are opened and closed by a 2-hp General Electric motor which drives a line shaft. Two 10-in. sheave wheels are keyed to the shaft and operate the door by two cables passing over them. The motor is started from the floor level by means of a small cable, and it is provided with an electric disk brake which operates automatically when the door is open to the full height.

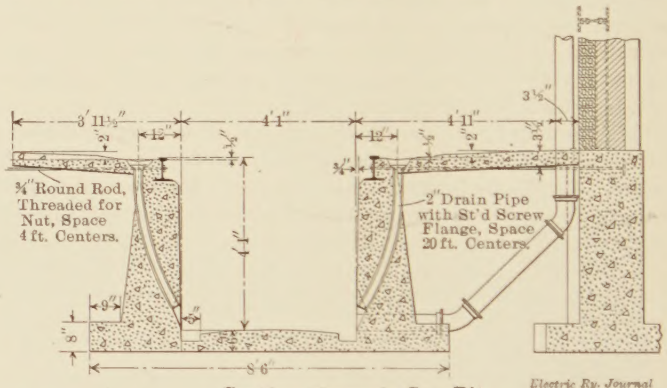
Two 5/16-in. continuous cables running a set of sheave wheels centered so as to conform to the curvature of the sheet steel raise and lower the doors. It requires thirty-five seconds to open the door its full height and fifteen seconds to close it. The engineers who designed the doors claim that they are not only weatherproof but that they are quick-acting. The effort required to open and close them has been reduced to a minimum so that the doors can be kept closed most of the time and thus maintain an even temperature.

CARHOUSE TROLLEY CONSTRUCTION

An especially designed dead-ending device and trolley guard, for closing the gap through which the car-entrance door is raised, were employed and are shown in the illustrations. The trolley guard is made of 16-gage sheet steel and is applied to the bottom flange of the door. It was bent in the form of a "V," and the operation of the doors may be adjusted so closely that when they are open the guard fits tight over the ends of the fiber strips which form the trolley-wheel runway on each side of the door opening.

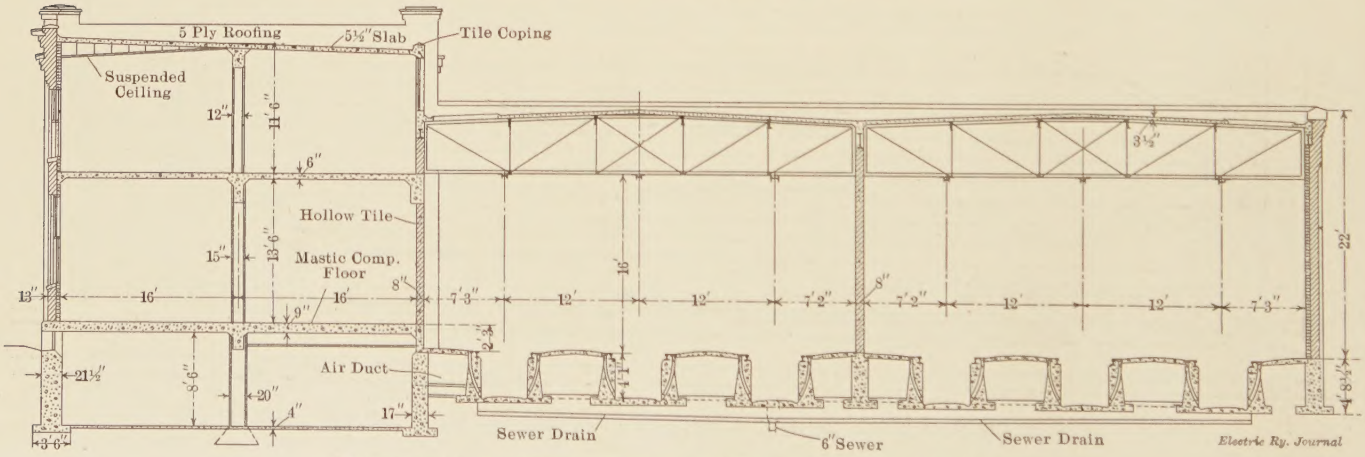


Section through Gutter.



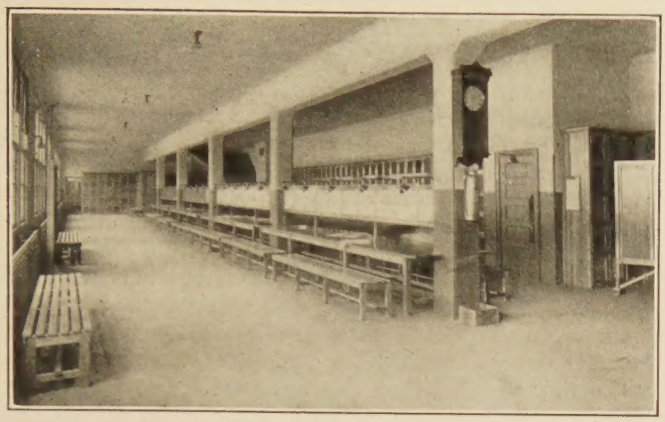
Section through Car Pit.

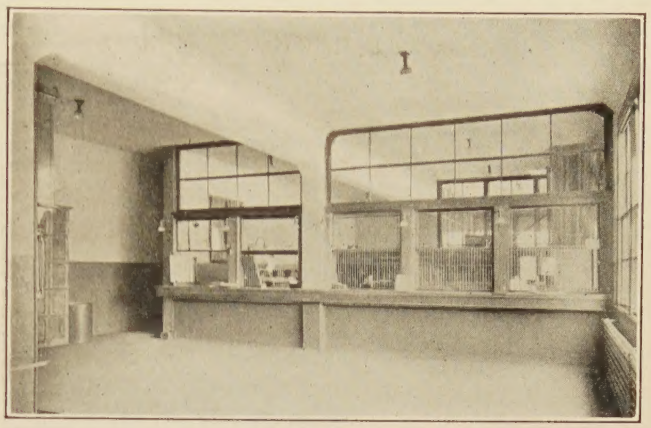
Minneapolis Carhouse—Details of Pit Construction



Minneapolis Carhouse—Transverse Cross-Section of Building

The trolley trough design is shown in the illustrations and consists of the usual shaped oak trolley trough with 2¾-in. by 4-in. inside dimensions. It is hung on the bottom cord of the roof trusses and on special hangers embedded in the concrete roof, spaced at 10-ft. intervals. The novel feature of the trolley trough construction is that the trolley wire has been replaced by a ⅛-in. x 1-in. copper bar which is applied to the trough by two 1-in. x 1-in. x ⅛-in. angles to which it has been riveted. The trough was assembled complete in 60-ft. lengths at the Twin City Company's shops before it was raised to the hangers in the new car shed.





Minneapolis Carhouse—Trainmen's Office and Locker Room and Division Cashier's Office on Ground Floor

TWO-STORY CONSTRUCTION DETAILS

The two-story and basement section of the carhouse is 34 ft. wide over all and 303 ft. long. It was built to provide space for the storage of light car-repair parts, car fuel and oil on part of the first and second floors, quarters for the underground cable maintenance department in the basement and spacious club rooms for the trainmen on the first and second floors. This section of the building was constructed on concrete foundations with structural-steel columns in the hollow-tile partition wall between it and the car sheds to support the car-shed roof trusses. A 13-in. brick wall supports the reinforced concrete floors and roof on the three exposed sides of the building. Reinforced concrete columns, 20 in., 15 in. and 12 in. respectively, support the two floor slabs and roof along the longitudinal center line of this section of the building.

The floor slab between the basement and first floor is 8 in. thick, reinforced with ½-in. rods spaced at 4-in. centers, and was designed to carry a load of 125 lb. per square foot. The floor between the first and second stories is 6 in. thick, reinforced with ½-in. rods on 24-in. centers and triangular mesh wire fabric, and was designed to carry 50 lb. per square foot. The roof slab is 5½ in. thick, reinforced with wire mesh. The floors in the first and second stories are constructed with a composition mastic wearing surface which makes them much warmer and more resilient than a plain concrete surface.

Minneapolis Carhouse—Reading Room

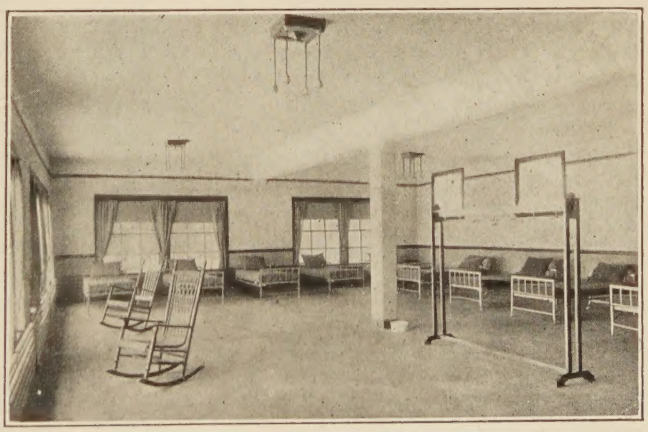
FLOOR PLANS

The basement of the two-story section of the carhouse has been made the headquarters for the underground department. Storage space has been provided for cables, conduit, etc., and a depressed track runs from the storage yard at the south end of the carhouse property into the basement. This track permits tools and cable to be handled readily to and from cars and greatly reduces the labor cost of handling this class of material.

The first floor is divided into a carhouse foreman's office, division cashier's office, trainmen's room and toilet, storerooms and workroom for carhouse supplies and workmen. The trainmen's office rooms have been plastered and finished in varnished yellow pine. The walls and ceiling have been tinted and stenciled in lead and oil, and tungsten ceiling fixtures in burnished brass finish the artificial illumination. Natural lighting is furnished through an almost continuous series of triple windows with slide sash in the east wall of the building.

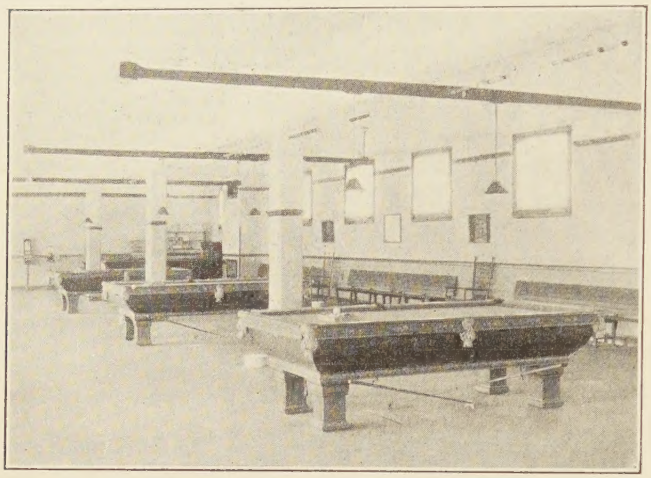
TRAINMEN'S OFFICE AND CLUB ROOMS

The trainmen's office is furnished with Georgia pine benches, and a wide flat-top table extends practically the full length of the room between the center row of columns. A two-sided card or bulletin rack has been built in over the center of the table where instructions to trainmen may be posted, and desk lamps spaced at 4-ft. intervals have been attached to the tops of the card racks. The trainmen use this flat-top table for counting change and making out reports before handing them in to the cashier, who is stationed in an office at one end of the room. Individual trainmen's lockers occupy considerable wall space in the office room, and a completely equipped toilet, 27 ft. x 32 ft., is situated at the center of this section of the building.



Minneapolis Carhouse—Trainmen's Rest Room

The second floor has been reserved for trainmen's club rooms and is finished in natural pine with tinted walls and ceiling. Neat and artistic draperies have been provided at all the windows. One end of this floor has been supplied with equipment with which the trainmen may take physical exercise. Three pool tables with a complete equipment have also been installed, and the men are charged a nominal amount per game. An illustration of this room is shown.



Minneapolis Carhouse—A Corner of the Employees' Recreation Room

Leading from the pool room to the sleeping room is a wide hall, shown in one of the illustrations, which has been furnished with tables, chairs, rockers and a complete line of engineering papers and fiction periodicals. The walls have been tinted and stenciled, and the light fixtures are of artistic design. The sleeping room, which is shown in the illustrations, is equipped with a number of cots, comfortable rockers and a clothes rack. Trainmen generally take advantage of the comforts which this room furnishes between shifts.

As the Twin City Rapid Transit Company has made it a rule to recruit its men from the rural districts rather than from the city, a large number of the unmarried trainmen have no attractive place in which to spend their time when off duty. The interest they are taking in the club rooms which the company has furnished at all division carhouses is an evidence of their appreciation of what has been done by the management. All club rooms of the company are under the supervision of P. J. Metzdorf, park manager, and the company pays all the running expenses.

OTHER DETAILS OF DESIGN

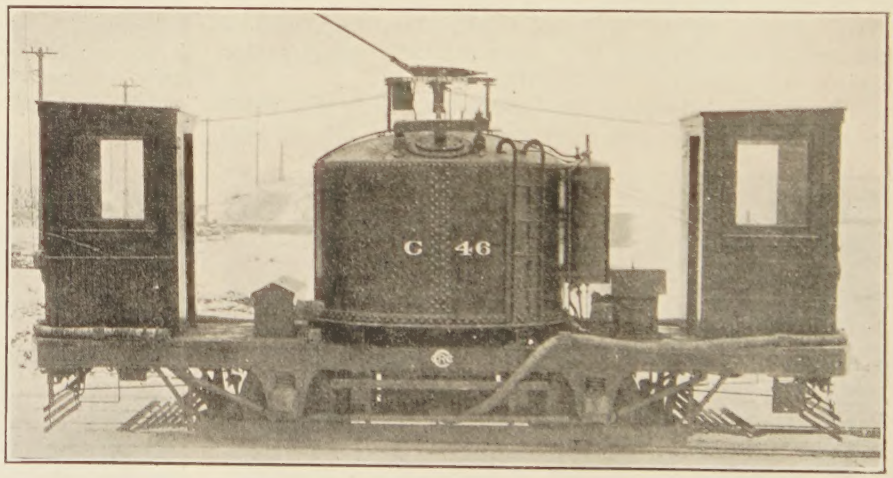
The two-story section of the building is served by a 5-ton, 30 ft. per minute elevator which is employed to transfer supplies between the second-floor storeroom and the car sheds and basement. Current for the station lighting is furnished at 220 volts d.c. by a motor-generator set which receives its energy from the trolley feeder. The low-pressure heating plant is situated in one of the old shop buildings about 150 ft. from the new carhouse, the feed and return piping being carried under the car storage yard and car sheds in a reinforced concrete tunnel. A depressed track, 7 ft. below the grade level of the yard, is installed adjacent to the boiler room to permit easy handling of ashes. Direct radiation for heating is used throughout, the car shed having pit coils as previously described and the two-story part of the building having pipe coils supported on wall racks below the windows.

CHICAGO CITY RAILWAY COMPANY'S SAND CAR WITH PNEUMATIC UNLOAD

Two sand-delivery cars, which greatly reduce the cost of handling sand from central sand-storage bins at Seventy-eighth Street and Vincennes Road to the various car storage houses, have been built at the Chicago City Railway shops and are now in regular service. As this company uses an average of 100 cu. yd. of sand per day during bad weather and in the winter months, the cost of transporting sand is quite a considerable item. Heretofore sand has been delivered by three 7-cu. yd. gondola cars provided with a roof and doors along the upper half of the car side. These cars were loaded at the spouts from the elevated sand-storage bins at the Chicago City Railway shops, and either it was necessary to cast the sand from the car into the smaller bins at the carhouses or if the bins were not situated near a track the sand had to be carried to them in pails. In wet weather it was almost impossible to keep the sand dry in the old cars and there was considerable loss of time in rehandling this wet sand.

The new sand cars are shown in detail in the illustrations and will carry about 10 cu. yd. of dry sand. They consist of an all-steel underframe 25 ft. x 6 ft. 6 9/16 in. over all, which forms the support for the sand tank and also acts as the truck frame. The side sills are constructed of 8-in., 18-lb. I-beams, and the bearings to each pair of wheels are carried in pedestals bolted to the lower flanges of the I-beam side sills. Two GE-80 motors with K-28-A control make up the motor equipment. A 50-cu. ft. per minute Allis-Chalmers air compressor operates the automatic air-brake equipment and furnishes air at 40 lb. pressure through a reducing valve to the sand tank. Two 16-in. x 45-in. air reservoirs have been mounted in an upright position beside the tank. These furnish the air reserve for both the brakes and sand tank.

The tank is 7 ft. 9 in. in diameter and 5 ft. 2½ in. in height, exclusive of the conical bottom, the apex of which is 2 ft. 1 in. below the bottom line of the tank proper and the top of which is spherical. All inside corners of the tank have been rounded so as to reduce to a minimum the amount of sand remaining after it has been emptied through

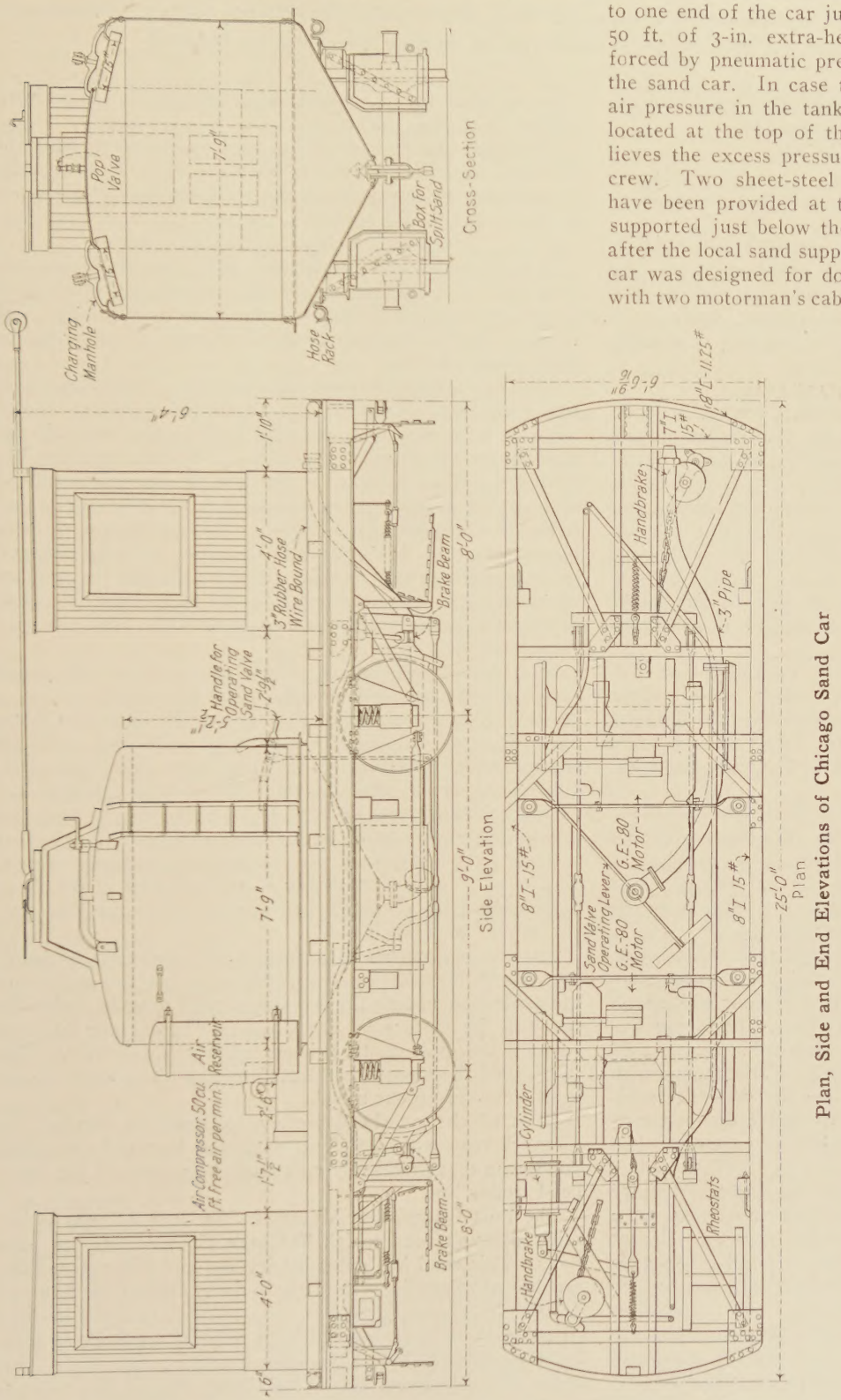


Chicago Sand Car with Pneumatic Unload

the valve at the bottom. The tank is constructed of ¼-in. sheet steel and a 4-in. x ¼-in. angle iron has been riveted at the joint between the sides and the bottom, reinforcing it against bursting pressure due to the air and sand. This angle reinforcement also serves as a step bearing for the tank, carrying the weight to the underframe of the car through combination channel and angle chairs riveted to both. The top of the tank is made of one piece of sheet steel pressed to form a shallow semi-sphere. Two 24-in. air-tight manhole covers close the tank-charging openings. The covers are provided with an especially designed lifting

lever for raising the cover clear of the opening and swinging it aside. This lever is used as a locking bar when the cover is over the manhole. In order to insure the tightness of the cover the lever is provided with a slot which passes over a 1¼-in. threaded rod applied to the top of the tank. When the cover is in the closed position a combination nut and crank is applied to the rod to clamp the cover down. The trolley stand is carried on two forged angle supports riveted to the top of the tank, to which two 6-in. x 1⅞-in. oak sticks have been bolted to furnish the bearing for the trolley stand proper. Heavily insulated cables lead from the trolley stand to the motorman's cabs at each end of the car.

The conical bottom of the tank is provided with a 3-in. outlet at the lowest point, and a special sand valve operated by a hand lever located on the side of the tank opposite the air reservoirs controls the outlet. The operation of the hand lever also automatically controls the air supply to the tank. The outlet pipe has a 90-deg. cast-iron elbow just below the tank and a length of curved pipe which brings it to one end of the car just below the bumper. By applying 50 ft. of 3-in. extra-heavy wire-bound hose the sand is forced by pneumatic pressure to any point within 50 ft. of the sand car. In case the outlet valve should clog or the air pressure in the tank should exceed 40 lb., a pop valve located at the top of the tank under the trolley stand relieves the excess pressure and indicates the trouble to the crew. Two sheet-steel boxes 15 in. x 22 in. x 3 ft. 6 in. have been provided at the center of each side of the car, supported just below the side sill, to receive the spilt sand after the local sand supply tanks have been filled. The sand car was designed for double-end operation and is provided with two motorman's cabs, 4 ft. x 4 ft. x 6 ft. 4 in., of wooden construction. In addition to the automatic air-brake equipment hand-brake levers have been installed in each cab. The two cars have been in service since January, 1912, and the results to date have been entirely satisfactory. The weight of the empty sand car is 27,760 lb., and when loaded to capacity it weighs 47,180 lb. The car was designed by the engineering department of the Chicago City Railway Company.



Plan, Side and End Elevations of Chicago Sand Car

INTERNATIONAL ELECTRICAL CONGRESS

At a meeting held in Boston on June 25 of the society representative members and of the committee on organization of the 1915 International Electrical Congress of San Francisco arrangements were completed for organizing the congress so as to assist and not conflict with the National General Engineering Congress that will be held in San Francisco in 1915. The International Electrical Congress has already been authorized by the International Electrotechnical Commission, which has recognized jurisdiction in such matters. It will be attended by representatives from electrical engineering societies and the governments of countries throughout the whole world. The committees thus far appointed have been selected by the American Institute of Electrical Engineers to obtain the proper co-operation with the American societies to insure the success of the congress. Both American and foreign societies will soon be requested to appoint delegates of their their own selection to represent them in the congress itself. The preliminary details are being arranged by the executive committee, consisting of Dr. C. P. Steinmetz, president; Dr. A. E. Kennelly, C. O. Mailloux, W. D. Weaver and H. A. Lardner, vice-presidents; Dr. E. B. Rosa, secretary; P. S. Millar, treasurer and business manager.

The Saratoga Convention of the New York State Association

At This Meeting, Held on June 26-27, the Association Changed Its Name to the New York Electric Railway Association—Abstracts of the Papers and Reports Are Published Below, with an Account of the Banquet

EXTENSION OF DIRECT-CURRENT RAILWAYS BY THE APPLICATION OF HIGHER VOLTAGES

BY WILLIAM P. WHITE, GENERAL ELECTRIC COMPANY

The writer will attempt to outline some different methods of obtaining and utilizing 1200-volt direct current. The conditions to be met arrange themselves into two general groups—one the changing over of present 600-volt or single-phase systems and the other the building of entirely new lines.

CHANGING A SINGLE-PHASE ROAD

To change over an existing single-phase road it is necessary to supply entirely new equipments for substations and cars and to change the transmission line, if single phase, to three phase or quarter phase. The overhead trolley, being insulated for the high-voltage alternating current, can be used without change for the 1200-volt direct current. The question then arises: If such changes are made, will the operating expense of the road be just as great as with the single-phase system? The best answer to this is the practical case of the Washington, Baltimore & Annapolis Electric Railway.

This road, connecting Washington, Baltimore and Annapolis, had a single-phase, 6600-volt system. After operating a year and a half as a single-phase road it was changed to a 1200-volt direct-current system. The change from single phase to 1200 volts was made in the following manner:

The cars used during the time that the single-phase system was in operation were 60 ft. long. On account of this extreme length and the excessive weight of the complicated a.c.-d.c. equipment the total weight per car was about 60 tons. This weight made the operation of cars over the city conduit system in Washington prohibitive.

When the change to 1200 volts was made it was possible to use practically 600-volt apparatus. This was mounted on a 50-ft. car having a seating capacity of fifty-four and a total weight, loaded and equipped, of 42 tons. Each car has four 600-volt motors insulated for 1200 volts, two motors being connected permanently in series. The control, with slight modification, is practically a standard 600-volt multiple-unit control with a dynamotor supplying 600-volt current for lights and for the operation of contactors when operating on 1200 volts.

In the substations two standard 600-volt, 25-cycle rotary converters, with additional insulation for 1200 volts, were connected in series to obtain 1200-volt current. Recent developments have made it possible to build a 25-cycle rotary converter with 1200 volts on one commutator, so that the present practice would be to use one rotary converter in place of two where only 1200-volt current is supplied from the substation. The direct-current, 1200-volt rotary converter panels were equipped with standard circuit breakers, switches, instruments and meters, located on the panel and insulated for the protection of the station operator. The circuit-breaker and main switch were placed side by side at the top of the 99-in. panel and separated by a slate barrier. Their operating handles are on the middle section of the panel approximately 30 in. above the floor. These handles are connected by means of insulating rods on the back of the board to the circuit-breaker and switch. The ammeter has a molded insulating cover. The wattmeter has a glass cover.

Since the change-over of the road in February, 1910, the carhouse expenses and power bill have been cut practically in half and the operation of the road has been satisfactory to the company and public.

CHANGING A LOW-TENSION D.-C. ROAD

If the road under consideration is a 600-volt, direct-current line, it is possible to use the existing apparatus to a large extent and to eliminate some of the substations. The Oregon Electric Railway gives an example of what can be done along this line.

This was a 600-volt road, the main line connecting Portland with Salem at the south, a distance of 51 miles. It also has two other divisions, 20 miles and 3 miles respectively, making a total of about 75 miles. The road is being extended south to Eugene, a distance of approximately 75 miles, and is contemplating a branch to McMinnville, a distance of approximately 25 miles. The entire system, with the exception of that portion in the cities, is being changed to 1200 volts, direct current. By this change the number of substations on the existing line will be reduced from five to three, while for the 75-mile extension only four new substations are required.

The 600-volt substations which are retained were made 1200-volt substations by placing in series two of the existing 600-volt rotary converters, the one on the high side being mounted on an insulating base of wood. The new 1200-volt substations will contain rotary converters delivering 1200-volt current from a single commutator. These machines are of the commutating-pole type and are capable of carrying momentarily three times load, or an overload twice as great as a rotary converter of the non-commutating-pole design. This type of rotary converter is well adapted to the large fluctuating loads of interurban service where the load factor on the machine is small.

The car equipments are changed for 1200 volts by using two motors connected permanently in series, the motors on the ground side being the 600-volt motors already under the car and the motors on the high side being new 600-volt commutating-pole motors insulated for 1200 volts. The gearing of the motors is selected to give the correct motor speed for a given car speed.

Most of the overhead trolley construction was of the catenary type with sufficient insulation to stand the added voltage so that practically no change was made in the overhead trolley line.

The Fort Dodge, Des Moines & Southern Railway is another 600-volt road which has been changed over to 1200 volts. This road has extended its line and has reduced the number of substations from six to five. One of the five is a substation for supplying 600 volts only, so that the number of substations in reality has been reduced from six to four, with 26 miles added to the total length of the road. This road, like the Ogden Electric Railway, has its 600-volt rotary converters connected in series to deliver 1200 volts, the rotary on the high side being mounted on insulating base. The substation on the new extension contains a rotary converter delivering 1200 volts from one commutator.

The two foregoing roads are sufficient examples to show what can be done in changing over 600-volt roads to 1200-volt roads and in so doing to continue to make use of existing equipment.

HIGH-TENSION D.-C. EQUIPMENT FOR NEW LINES

In the construction of an entirely new suburban or interurban road the high-voltage, direct-current system will show a lower initial investment and operating cost than any other. Its recent installations on what might be considered extensions of city systems, or as connecting links between city systems, are the Indianapolis & Louisville Traction Company, the Shore Line Electric Company, the Nashville & Gallatin Railway, the Kansas City, Clay County & St. Joseph Railway Company, the Davenport & Muscatine Railway Company and the Central California Traction Company. A short description of each of these roads will serve to illustrate the different ways in which 1200 volts is obtained.

The Indianapolis & Louisville Traction Company connects Seymour and Sellersburg in Indiana, a total length of 41 miles. The company operates through cars between Indianapolis and Louisville, 110 miles. The general scheme of electrification is of great interest owing to its being of the simplest nature possible. The power house is situated midway between Seymour and Sellersburg and the whole 41 miles is fed without substations. The 1200-volt circuits are obtained from two 600-volt engine-driven generators connected in series. The car equipments consist of four 600-volt motors insulated for 1200 volts, operated two in series on 1200 volts and all in multiple on 600 volts. As is usual on large 1200-volt equipments, a dynamotor is provided to supply 600 volts for auxiliary circuits, including secondary control, lighting and compressor circuits.

The Shore Line Electric Company operates along the Connecticut shore of Long Island Sound, connecting New Haven with the towns of the lower Connecticut River. The total length of line is about 52 miles. The power house, which generates 60-cycle alternating current, is located at Saybrook. One of the two substations is located 1 mile from Saybrook and the other is at Guilford. Each substation contains three 600-volt, 60-cycle rotary converters, each insulated for 1200 volts, with the switching so arranged that any two machines can be connected in series, any machine being thrown on the high or low side. The Guilford substation furnishes 600 volts as well as 1200 volts, the former potential being taken off between the two machines. The rolling stock has the standard arrangement of two motors in series for 1200 volts. Owing to the small amount of 600-volt running, the control is designed to give half speed on 600 volts.

The Nashville & Gallatin Railway, in the layout of substation and car equipments, is similar to the Shore Line Electric. The 23-mile section connecting Nashville with Gallatin is fed from one substation located at the center of the line. This substation contains three 60-cycle, 600-volt rotary converters, each insulated for 1200 volts, with the switching so arranged that two rotary converters can be connected in series and the spare converter can be substituted for either the high or low machine. The car equipments use the same arrangement of motors as the Shore Line Electric.

The Kansas City, Clay County & St. Joseph Railway, 70 miles long, connects Kansas City with St. Joseph and also with Excelsior Springs, operating 1200 volts between cities and 600 volts over the local lines. Power is supplied by the Metropolitan Street Railway Company at Kansas City to three substations, each substation containing two 25-cycle, 1500-volt rotary converters, 1500 volts being obtained from a single commutator. The car equipments have two motors in series, the current for the control of contactors and for lighting being supplied from a dynamotor.

The Davenport & Muscatine Railway will have a total length of 30 miles with 4 miles of 600-volt operation. The power for operating the system will be furnished by the Tri-City Railway & Light Company. Two substations are being installed, each containing two motor-generator sets, the generators of which are designed to give 1200 volts from a single commutator. The rolling stock, while equipped with motors operated two in series on 1200 volts, has a cylinder type of control which eliminates the dynamotor and takes the lighting direct from 1200 volts.

The Central California Traction Company, connecting Sacramento with Stockton, has approximately 55 miles at 1200 volts and 7 miles at 600 volts. There are three substations, two of these being identical and containing motor-generator sets with generators which deliver 1200 volts from a single commutator. The remaining substation contains a three-unit motor generator set, consisting of one motor and two 600-volt generators, so that both 600 volts and 1200 volts can be supplied. The two most interesting features of this road are the motors of the car equipments, which are straight 1200-volt, and the 1200-volt third-rail, and, although this is the only installation of this kind in the country, the same successful results have been experienced as are common to all 1200-volt systems.

CONCLUSION

It has been shown by the foregoing practical illustrations that the 1200-volt system readily lends itself for adoption on extensions of direct-current railways, regardless of the source of power or type of apparatus used. The roads hereinbefore described cover examples of two 600-volt generators or rotary converters in series; straight 1200-volt generator or rotary converter; two 600-volt railway motors in series; straight 1200-volt motor; 1200-volt overhead trolley and 1200-volt third-rail. It is the simplicity, flexibility, reliability and low operating cost of this system that have resulted in its being a signal success wherever installed. The system should in no way be looked upon as being in the experimental stage, and any railway contemplating suburban or interurban extensions can adopt the 1200-volt system with every assurance of success.

RECENT DEVELOPMENTS OF RAILWAY EQUIPMENT

BY K. SIMMON, WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY

Many city equipments in the past have been geared for speeds entirely too high for their service. This has resulted in excessive power consumption and overloaded motors. Recently one of the large operating companies of this country discovered this to be the case with its cars and changed the gears and pinions of all equipments. After this was done the power consumption was reduced approximately 15 per cent. It has been stated by good authorities that from 5 to 15 per cent of all the power used for traction purposes could be saved by the proper application of motors and gear ratios.

The proper gearing of motors, moreover, has a considerable bearing upon the cost of maintenance. If a car is geared for an unnecessarily high speed, it is equivalent, as far as motors are concerned, to operating at a low line voltage. Under such conditions an unnecessarily large amount of power will be used, the motors will run unnecessarily warm and the cost of maintenance will be unnecessarily high. Not only is this true of the motors, but also of the controllers, resistance and other parts of the electrical equipment. It will generally be found that motors will operate most efficiently when geared for the lowest speed which will maintain the schedule.

WEIGHT REDUCTION

A second step in the direction of economy is the elimination of excess weight. The usual assumption is that it costs from $40 to $150 per year for power to move each ton of car weight. But it is very easy to carry the reduction in weight so far that ruggedness and reliability of operation are sacrificed for the sake of lightness. This result has actually been reached in one of the Middle Western cities

where it has been found that a new lot of light-weight cars were in the shop for mechanical repairs during an unsually large percentage of the time.

The effort to reduce weight has not been expended entirely on car bodies and trucks but has also been directed toward the motors and multiple-unit control apparatus. The reduction in the weight, as well as improvements, in the latter have been quite marked, although the weights of railway motors in which the armature speeds are not increased have not been materially reduced. There have, however, been material reductions in the weights of motors by the use of increased armature speeds. But these speeds when applied to city service result in greater rather than lower energy consumption in spite of the reduction of weight which is thus obtained.

Better circulation of air through motors by the use of a fan on the end of the armature was introduced on the New Haven locomotives about two years ago. Since that time this same arrangement has been introduced on smaller motors, but as these smaller sizes of motors are used largely in city service, many operating men have considered their open feature objectionable on account of the accumulation of brakeshoe dust and other foreign material inside the motor. The tendency of late years has been toward an inclosed motor for this class of service.

Up to the present time the greatest reductions in power consumption in motors have been effected by the use of commutating-pole motors with field control, the application of the proper size of motors and proper gear ratios. Other improvements in motors have been the use of insulating material capable of withstanding higher working temperatures, better brushes, higher grade bearing metals and the substitution of malleable iron and cast steel for cast iron, yet the general mechanical construction of the motor to-day is essentially the same as that adopted some six or seven years ago for the well-known No. 101-B-2 motor.

MULTIPLE-UNIT CONTROL

The many advantages of multiple-unit operation, such as reduction of platform expense, flexibility of equipment, reliability, decreased maintenance charges, less liability of accident and simplicity, are being appreciated more to-day than ever before. A comparatively short time ago when one spoke of multiple-unit control it was customary to think of a more or less complicated type of automatic control embodying intricate control circuits, many interlocks and the services of experienced and comparatively high-priced men to maintain it. To-day we find on the market multiple-unit control which is extremely simple and reliable and without the disadvantages of the former type. At one time a control maintenance of $1 per 1000 car miles was considered a very satisfactory operation, whereas to-day this figure has been reduced to a value of little moment, and we find that it is not at all uncommon for the control to be inspected on a 1000-mile basis, and in some cases the inspection periods have been increased to 2000 miles with satisfactory results.

FIELD CONTROL

During the past two years field control has been tried out in different classes of service on cars and has been equally successful with hand controllers and with multiple-unit equipments. It makes a direct saving by reducing the power lost in rheostats, being equivalent in this respect to a motor geared for very slow speed but having a speed characteristic suitable for high speed where desired. In other words, it practically results in a flexible equipment with a double gear ratio. In general, it will save somewhat more than one-half the rheostatic losses which cannot be avoided with the common type of control.

Although drum-type controllers have been developed and are available for field control, unit-switch control is more readily modified to include this feature. In the case of a control for a quadruple equipment of 50-hp motors this is accomplished by the addition of a small field change-over switch weighing approximately 125 lb. or by the use of additional unit switches.

Another economy is that obtained by the use of "coasting clocks" or some other instrument which puts a check on the waste of power by the motorman.

LOW-PLATFORM CARS

P. N. Jones, general superintendent Pittsburgh Railways, the first to adopt this type of construction for trail cars, will soon test a motor car built along similar lines. However, instead of employing maximum-traction trucks or large-diameter wheels, all wheels will be but 24 in. in diameter, and each axle will be equipped with a 30-hp small-diameter elongated motor, cleverly nicknamed the "dachshund" motor. The advantages incident to this type of car are well known, and this application is certainly one of merit.

HIGH-VOLTAGE DIRECT CURRENT

In general the use of a high-voltage direct-current trolley has not necessitated any radical departure in the design of the electrical equipment; nevertheless, it has required the modification of practically all control apparatus in order to obtain increased creepage distances and more liberal gas chambers. The largest and highest voltage direct-current installation in this country is the Piedmont & Northern Railway. The cars on this line are equipped with HL control in which an eleven-notch control is obtained with but thirteen switches, even though there are five switches in series to open the circuit. These equipments, instead of being supplied with a dynamotor and standard 600-volt compressor, are equipped with a dynamotor compressor in which a double commutator motor floats across the line continuously and is attached to a pinion engaging a gear which drives the compressor through a pneumatically operated clutch controlled by the pump governor. This arrangement eliminates the compressor motor common to most 1200-volt equipments, thereby effecting a saving in weight of approximately 450 lb.

SINGLE-PHASE SYSTEM

There have been numerous improvements in single-phase system motors and control. The foremost recent single-phase installation is the New York, Westchester & Boston Railway. The car motors on this line are cooled by air supplied by an external fan, resulting in a continuous rating of over 75 per cent of the nominal or one-hour rating. The compensating winding is short-circuited, giving inductive compensation and making the insulation strain to ground negligible. The preventive leads are of an improved design and the control includes but seven low-voltage unit switches, even though arranged for automatic acceleration.

During the past eighteen months the single-phase roads in operation and the new single-phase installations have ordered car equipments aggregating 77,000 hp, which would correspond to the motive power on over 250 cars each equipped with four 75-hp motors.

Abroad the government railways of Germany, France and Switzerland have adopted the single-phase system as standard for future installations.

FUTURE CHANGES

In motors it is reasonable to expect to see no radical changes during the next year other than a general arrangement of the motors for field control, improvement in ventilation, slight reduction in weights and the design of some special sizes for the new small-wheel, low-frame cars.

In control we can expect to see a great increase in the use of the multiple-unit control in city as well as interurban railways. The cost of operation will be a large factor in effecting this change, and developments which are now under way will make it desirable not only from standpoint of first cost but of cost of maintenance.

PREVENTION OF ACCIDENTS FROM A LEGAL STANDPOINT

BY W. B. BAKER, ATTORNEY FONDA, JOHNSTOWN & GLOVERSVILLE RAILROAD

The term accident has been defined by Webster as an event that takes place without one's foresight or expectation, an event which proceeds from an unknown cause and therefore is not expected. By Worcester it is defined as an event proceeding from an unknown cause. By the federal courts it has been defined as an event happening without the concurrence or the will of the person by whose agency it was caused; anything occurring unexpectedly or without any known or assignable cause or without one's direct intention.

Again, the courts have said that an accident is an occurrence that human prescience and prudence cannot foresee or forestall, and that that which is called an accident in law is something which occurs after the exercise of the care that the law requires to be exercised to prevent the occurrence.

It would seem, after considering some of the above definitions, that were it not for the fact that a railroad company in transporting passengers is bound to use the utmost care so far as human skill and foresight go to avoid accidents arising from the condition of its road and machinery, and were it not for that class of lawyers, happily few in number, known as "ambulance chasers," the railroad companies would not be so vitally interested from a financial standpoint in the prevention of those occurrences which are purely accidents happening upon their roads.

In the everyday vernacular, however, every injury to person or property that is not intentional and wilful is called an accident, whether due to the negligence of either the party causing it or of the party injured. It is with these latter classes that railroad men are most concerned.

PROPER INSTRUCTION NECESSARY

Continuous systematic instruction of all employees, not alone in their particular line of employment but in and along all lines relating thereto or closely connected therewith, especially wherever human safety and the protection of property is concerned, is vitally necessary. In many cases, especially those involving injuries to employees, the only negligence chargeable, or upon which a question of fact for a jury can arise, is lack of proper instruction given to the employee.

Again, another feature upon which many a case turns is the question of the competency of those in positions of authority over others, those exercising acts of superintendence, so called. Not only should the master employ in such position only those whose competency cannot be questioned, but, more than that, the master must impress upon such persons' minds the duty and great importance of the proper instruction by them of those who are to labor under their direction.

Schools of instruction for the different classes of employees should be frequently held, where those in positions of authority should not only impress upon employees the necessity of fully acquainting themselves with the proper manner of discharging their duties and with the duty which they owe to the public, but, in addition, those in positions of authority should themselves be fully impressed with the results and effects that might legitimately be expected to follow from carelessness or the omission of some duty to the public.

INSPECTIONS BY LEGAL DEPARTMENT

The legal department of every railroad company should have at least one or more of its members personally acquainted with the entire railroad system. This would involve actual inspection of the roadbed and equipment by some representative of this department; not that inspection, of course, which is supposed to be made by those whose duty it is to ascertain the exact physical conditions of road and rolling stock, but such an inspection as would clearly impress upon the mind of such representative the general conditions and would leave in his mind a general knowledge of existing conditions.

Again, when making such inspection, or rather when accompanying officials who are making the inspection, the lawyer may observe that existing conditions at or near a station are such that, while from a railroad man's point of view the happening of any accident is scarcely possible and entirely improbable, yet if one does occur, he may see that there will be undoubtedly liability upon the part of the railroad company to the party injured and that in an action brought by the injured party the procedure would be practically an assessment of damages, no real defense existing.

LACK OF PLANKING AT STATIONS

For instance, the attorney, as he approaches a station, may notice that, except for the comparatively short distance right in front of the depot, the spaces between the tracks and rails are neither planked nor filled in. It will at once occur to him that some stranger, when alighting at night from a train longer than usual or from a car stopped on either side of those planked and filled portions, may trip over the projecting rails on his way from the point of alighting toward the depot and be injured. Especially is such an accident liable to happen at stations in the rural districts where there are no lights, or at poorly lighted stations in a city. This is also likely to occur at stations where at times long excursion trains are stopped and passengers alight therefrom or proceed from the depot to board one of the cars which is not perhaps directly opposite this planked or filled space.

Observing those conditions, the attorney will of course at once suggest to those in charge that in case of an accident the company will be compelled to respond in damages, and that under certain circumstances and surroundings to which he will refer the company will have no legitimate defense.

Again, in this connection, it will undoubtedly occur to the attorney to advise that engineers and motormen be especially careful in stopping their trains at night and so stop them that the cars from which passengers are expected to alight will be at and oppposite the planked and filled place designed for the alighting of passengers. Until such conditions are remedied the conductors and trainmen should be instructed to guide their passengers perhaps through one or more cars to a safe place appointed by the company. Of course, this situation arises only where there are tracks between the depot and the passenger track, but it always arises if there be a double-tracked road or a road with more than one track. The instructions just referred to could be given to the employees either at the schools of instruction above mentioned or by the general manager in his office.

If one observes conditions at present existing on many lines, at stations both rural and otherwise, and at the same time is familiar with the decisions by the courts of this State, especially the case of Hancock against the New York Central & Hudson River Railroad Company (184 New York, page 540), the need of the utmost care in providing a safe place for passengers to alight at depots maintained by the company cannot be overestimated.

It is true that this strict rule pertaining to steam railroad trains stopping at stations perhaps is not to be so rigidly adhered to in the case of street railroad cars stopping upon the public streets, but wherever the street railway company maintains a station at which its cars stop for the discharge and the receipt of passengers, in my opinion, the rule is the same.

STOP AT SWITCHES

Again, for instance, the attorney may observe upon approaching some station where by reason of peculiar conditions either a stop has to be made and a switch thrown

or the car has to back in to the depot, making a positive stop necessary, that passengers are likely to arise and, thinking the station has been reached, start to alight, while the conductor is attending to the throwing of the switch or watching his trolley after giving the order to back in.

Particularly is the passenger who is a stranger likely to attempt to leave the car if this stop occurs upon the street near the station or upon or near a crosswalk. To start under such conditions endangers not alone the passenger attempting to alight but the pedestrian who attempts to cross upon the walk and has reached a point out of sight of the motorman when he receives the bells to back the car. Upon observing such conditions, the attorney will advise the management that from a legal standpoint the most extreme care is necessary; otherwise legal liability for any accident occurring under such conditions is sure to result.

The effect of such advice will soon be apparent either in a radical change of existing physical conditions or in the further instructions and orders given to the men operating cars at such a point. They should include more definite and certain apprising of passengers at such time of the fact that the stop is not made for the purpose of discharging or taking on passengers and that the station has not been reached. The temporary stop will be thereafter made so that the steps are not near a crosswalk, thus avoiding to some extent the danger to pedestrians.

STOPS ON STREETS UNDER REPAIR

The attorney may observe that motormen stop their cars at the usual stopping places in the streets irrespective of the fact that the city or municipality is making improvements or repairs at that precise point. The law in reference to a safe place for passengers to alight and its application to such existing conditions should be pointed out and explained, and the management should at once instruct the motormen in general and any offending ones in particular as to the proper management of cars under such circumstances.

TALKS AT CLUB ROOMS

By continued systematic instruction I mean not only the formal and thorough instruction of the employee as to the details of his work as given by wise masters, but I go further than that. At the club rooms now maintained by most of the railroad companies for the use and enjoyment of their employees gatherings of a social nature are or should be frequently held, and such meetings the officers of the company, so far as possible and so far as agreeable to the men, should attend.

There, again, can valuable suggestions be made to the men at a time when they are in a most friendly and receptive mood. Perhaps a recent decision upon a certain state of facts involving conditions and circumstances of interest to railroad men can be explained to them in a plain yet in an interesting and instructive manner, and advice be given as to the proper manner and means of avoiding a similar experience upon their part and suggestions as to what they should do, having in mind the welfare of the railroad company, if such a situation should arise. Valuable material for the defense is frequently and forever lost by the failure upon the part of some employee to act promptly in a certain manner under certain circumstances. The calling of the attention of some of the passengers at the time to some existing circumstance or condition may firmly fix in their minds matters of great value to the defense in an action thereafter brought against the company by others for injuries alleged to have been received under such circumstances.

The discussion of such matters at the social meetings above referred to will not only cause men to be better prepared to guard the company's interests in case of accident, but in such discussions the employee's mind will perhaps receive an impression which will make him more alert in avoiding such an accident in the future.

RELATIONS WITH EMPLOYEES

The utmost harmony between the officers and employees should prevail at all times. In no way can so-called accidents be prevented if such harmony does not prevail. The employees should feel that whenever they have any real or fancied grievance those in authority are willing to listen attentively and treat them courteously and, if the grievance be real, that it will be at once remedied if possible. If it be fancied, a heart-to-heart talk between them, in the vast majority of cases, will remove the fancied grievance from the employee's mind. Under such treatment of men by railroad companies loyalty upon the part of the men will be engendered and will continue.

While discipline must at all times be rigidly maintained and punishment suitable to any offense be fearlessly meted out to the offender, yet at all times that punishment should be suitable to the offense.

Where, however, the offense consists more in an honest error of judgment under circumstances where the proper course to pursue can be at the most only guessed at, then, although the results show the error of judgment upon the part of the employee, his discipline should consist principally in trying to impress upon his mind the effect of his error and in assisting him to gather from the circumstances some light by which he may be guided under future similar conditions. Such a rule, if properly enforced will not destroy but will preserve harmony.

On the other hand, faithful service deserves and should receive its suitable reward, and in the early instruction of the employee it should be impressed upon his mind that the company is and will be grateful for earnest, efficient service and that the proper protection and safety of human life and limb and of property intrusted to his care are the most important facts to be weighed in his favor when his claim for promotion and increased wages is being considered by his employer.

INSPECTION OF EQUIPMENT

No more important duty devolves upon railroad companies than the duty of proper inspection of roadbed, cars and appliances. No duty should be more conscientiously performed, for upon it may, and I believe does, depend the freedom of a road from accidents. The mode of inspection should be such as is by experience found adequate and sufficient to discover defects if they exist, and inspections should be made with such frequency as liability to impairment reasonably requires.

This inspection should not be confined to tracks and roadbed owned by the company but should extend to all lines over which it operates its cars by virtue of having leased or otherwise obtained trackage rights over such roads. It should include also bridges of other companies over which its cars run. The liability of the company is not lessened by virtue of the fact that the defective roadbed is upon a leased line or a line or bridge over which the company has trackage rights. The employees of the company, if properly instructed and if loyal to their employer, would promptly report the existence of any defect observed by them upon such road or bridge over which they operate the cars of the company.

INSTRUCTION OF SCHOOL CHILDREN

The proper education and instruction of school children, from the kindergarten grade to graduation, as to the danger of accidents arising from careless crossing of railroad tracks, should be carried on in all schools.

The occasional talk by the claim agent in the schools is good but valueless unless followed up by the constant effort upon the part of the teacher in every room to instil into each pupil's mind the danger of carelessness in this respect.

Upon the dismissal of school at noon and at night, the last words the pupil, especially the child under fifteen years of age, should hear ought to be: "Be careful when crossing railroad tracks; look both ways before you cross."

Moneys raised by taxation are used to employ school nurses and examining physicians properly to preserve the eyes, teeth and general health. Could a few moments of the valuable time of a teacher be used to better advantage than in educating a child to be careful at all times when near or crossing railroad tracks?

With harmony existing in all branches of the service, with continued and systematic instruction of employees, with proper and adequate inspection of roadbed, rolling stock and machinery, and with a legal department thoroughly conversant with the physical conditions of the system and as well versed as possible in knowledge of the law applicable to questions which constantly are arising in railroad matters, a railroad company ought to be fairly well equipped to meet the question of accidents and to a great degree prevent their happening. Then, when they happen, it should be able to minimize the legal and financial responsibility therefor, and with the proper education and instruction of children along the lines suggested railroad operations in the future ought to be reasonably free from the present "always-liable-to-happen" accidents.

PREVENTION OF ACCIDENTS FROM THE STANDPOINT OF THE OPERATING DEPARTMENT

BY J. F. HAMILTON, GENERAL MANAGER SCHENECTADY RAILWAY

Of vital concern to every street railway company in this country to-day, both large and small, is the problem of the accident, with the resultant drain upon our treasury through the claim channel.

We have gradually increased the service rendered to patrons with absolutely no increase in compensation therefor, until, with all our care to render this ever-increasing service at a cost within the confines of the 5-cent piece, we have, it seems, reached the limit within which this can be accomplished. And it is true that we have probably reduced to a minimum the cost of the mere operation of the cars through the streets. But have we actually exhausted all the means we have at our command to make further savings? Have we not overlooked a wasteful expenditure of the company's money for a purpose that is not really required for the propulsion of cars, but is made necessary because the cars are not propelled safely; an expenditure which far exceeds any of those which we have been devoting all our energies to minimize? If we have been sacrificing or overlooking the factor of safety in an endeavor to gain certain results—and it would seem as if this were certainly a fact, when we are confronted with our increased accident costs—is it not time that we were awakening to a proper realization of the matter? And that we are awakening to just such a realization is evidenced by the fact that the subject we are considering was selected as the principal topic for discussion at this meeting.

The primary cause of the majority of our accidents is human failure, in one form or another, rather than failure of apparatus. We therefore should endeavor to obtain and adopt such corrective measures as will remedy the faults and increase the efficiency of the human factor in connection with the operation of cars.

Naturally our duty and opportunity in this direction are associated more closely with our employees than with the public. And our task from this standpoint presents itself even before men are actually taken into the employ of the company; for it is absolutely necessary in order to gain proper results that only the most desirable type of men procurable be selected for the service to be performed. This initial duty rests with the official in charge of hiring men, who, above all else, should be a capable judge of human nature. Unless the men selected are of a material that can be molded into efficient trainmen, the service in consequence must suffer, not only on account of their individual inefficiency, but also on account of the influence their actions have on the other men.

After the man has been selected on probation, much depends on the methods pursued in rounding him into shape for actual work on the cars, and too much care and attention cannot be given in drilling him in the various duties he is to perform, as it is of the utmost importance that a man be started with a correct knowledge of his work The mistake should not be made of stopping the man's education when he is appointed into the regular service, which is the practice on too many roads, but his instruction should be kept up to the very last day of his employment with the company, for it is only by constant follow-up instruction in the rules and regulations that a man is kept trained thoroughly in his work and is prepared to meet an emergency when it arises It is an emergency more than anything else that shows a man's previous training; that is, his preparedness

This follow-up instruction can be carried on in numerous ways, chief among which is by the traveling instructor, whose duty it is to correct faults of individual trainmen as observed in their operation of cars. Another means is the lecture, delivered by the head of the operating department or others, on subjects pertaining to the every-day work of the trainmen. Interest, as well as good results in this direction, may be obtained by occasionally having men from the ranks deliver talks on assigned topics. The subject matter of these talks should be usually of a nature particularly applicable in connection with the data given. For instance, in the spring, by selecting the topic of open cars as the theme, we have an opportunity to call attention to the liability of accidents in the operation of this type of equipment and the importance of not only being familiar with the specific rules governing the movement of such cars, but of the absolute necessity of observing them strictly.

It is also possible to gain good results by posting bulletins dealing with the particular subject it is desired to call to the special notice of the employees.

An exceptionally good method of keeping the men familiar with the rules is by means of "surprise" examinations on the book of rules.

One reason why we are burdened with numerous accidents of a class that should have been avoided is undoubtedly the fact that when accidents are most liable to occur, that is when we are handling the greatest number of people, our cars necessarily are manned to a large extent by extra men, or, in other words, by men who have not been comparatively long in the service and who are not as experienced for that reason as the regular men; whereas during the times when accidents are least apt to take place the cars are in charge of our most experienced men, the regular trainmen. As experience is a particularly important quality for a trainman to possess, and something that the new man coming into the service has to gain, the matter of decreasing the percentage of men leaving the service for one reason or another is well worthy of much serious study at the present time.

Unquestionably the greatest fault we have to contend with in the matter of preventing accidents is the human tendency to be careless, a tendency far more pronounced in the public than in our employees, for the reason that we are able to a large degree to check and do check this propensity in those subject to us. On account of the authority we have over the trainmen, it should be our constant endeavor to impress upon them in every possible way the great need of care in all matters connected with the operation of cars. They should be taught that safety is to be considered above everything else, that they should use the safe course at all times and never take chances. Safety is sacrificed very often through a mistaken idea of duty; a great many men operate cars apparently with the principal object of running them from one point to another on a prescribed schedule, the factor of

safety being of secondary consideration. This is a state of mind that all our training and instruction should endeavor to prevent, if we are going to cut down the number of our accidents.

INDIVIDUAL TYPES OF ACCIDENTS

Collisions are of frequent occurence, and especial attention should be given in our training and rules to avoid them. Our motormen should be familiar with the traffic laws of the city and should be taught that others have equal rights in the street. Safety stops should be made by absolute stops and mere reduction of speed should not be tolerated under any circumstances, as people learn to know that safety stops are made at certain points and act with that thought in mind. There are a great many points in the matter of operation during fogs, over steam railroad crossings, on hills, at points where our lines intersect, when passing a standing car, when passing children in the street, and many others, but space forbids a detailed consideration at this time.

In boarding and alighting accidents our relations with the traveling public are particularly close, and our problem in connection with such accidents is divided about equally between our employees and the public. Proper rules should be in effect governing the boarding and alighting of people, and these rules should be complied with strictly. It is of the utmost importance that signals to motormen be given solely by conductors, and that the motormen observe only the proper signals. In starting a car, as well as when the car comes to a stop, a conductor should be on the rear platform, and he should take every means to prevent passengers from leaving the car until the stop is actually made. In the operation of open cars, the conductor has not absolute control over all means of exit, and at times it is impossible for a conductor to reach the rear platform of a closed car. In such cases an important precautionary measure in the prevention of accidents is for him to call a warning to the person or persons to wait until the car stops; this also is a great aid in securing witnesses. Crowded platforms are the cause of many alighting accidents, and we should endeavor to keep them clear as much as possible. Much good can be accomplished in the prevention of all kinds of accidents through instruction of the public; this applies particularly to the boarding and alighting accidents. We can use space in our cars and the back of transfers for this purpose; also space in the daily newspapers; and we should endeavor to secure the active co-operation of the board of education in the special instruction of children.

While it is true that a large percentage of all accidents are due to direct human failure, at the same time there are accidents attributable to apparatus, and it is the particular duty of our mechanical department to see that the equipment is kept in condition for safe operation. Defects occurring to equipment on the road should be reported by the employees. This is a method of co-operation between the operating department and the mechanical department, and a means of avoiding accidents by calling immediate attention to defects for necessary repair.

As a preventive of accidents and to guard against human failure, such mechanical devices and equipment, of course, should be adopted as will make the operation of our cars more safe.

CO-OPERATION BETWEEN DEPARTMENTS

The question of co-operation between claim department and operating department is purely and simply one of organization. The different departments of a railway company are merely links that make up a chain that we call organization. Every link in this chain has its duty to perform in unison with the other links, and this is what we call co-operation between the various departments of an organization, a relation that is absolutely necessary to the success of a railway or any other business. The operating department as well as the claim department has its individual duties to perform, and the two departments as links in the chain of organization have certain duties to perform in the matter of co-operation, not only in connection with each other, but with all other departments as well. As we are all working with the same ultimate end in view, the help that we render to another in his individual capacity means that we are aiding ourselves.

When the jurisdiction of one department extends into another in such a manner as to hamper or interfere with the proper handling of the second department by its accredited head, we have a condition that is not beneficial and is not what is meant by co-operation.

With specific reference to a harmonious co-operation between the operating and claim departments, the above is particularly pertinent. The relations between these two departments should be especially close and friendly, and there is no reason why they should not be so if a proper plan of co-operation is followed out. The matter of training employees, with the exception possibly of the instructions in regard to making out accident reports, securing witnesses, and the like, should be in the hands of the operating department; and the administration of discipline should be entirely in that department. The operating department can aid the claim department in its work in various ways: by securing proper men for the operation of cars; by training them properly; by seeing to it that the rules are observed strictly and that accident reports are made properly for all accidents and turned in promptly, and by having an adequate system of discipline, administered in such a manner as to gain the desired results. The claim department, on its part, can assist the operating department in numerous directions, as, for instance, by turning over such additional information as it obtains in relation to the cause of accidents, thus assisting the operating department in the work of discipline. It is a great advantage to the operating department to be furnished by the claim department, from time to time, with analyses of accidents that have occurred, making it possible to adopt such precautionary measures as a study of the analyses would seem to warrant. As a means of proper co-operation, the heads of the two departments should confer frequently, and at these conferences go over various matters of mutual interest, as, for instance, instruction, training, discipline, methods, etc., and particularly in regard to accidents that have happened, discussing the possible remedies for the prevention or reduction of like accidents.

From whatever standpoint we look at the subject of prevention of accidents, we must all agree that it is one requiring the most serious study at this time, if we are going to decrease the disbursement of money for damage claims, and thereby make additional funds that are needed so urgently available for other purposes.

THE PREVENTION OF ACCIDENTS FROM THE CLAIM AGENT'S STANDPOINT

BY JAMES M'PHILLIPS, ATTORNEY HUDSON VALLEY RAILWAY

To the legal and claim department the weaknesses and imperfections of the operating machinery of a railway company are always apparent, for this department is continually advised of the occurrence of accidents through one or another of preventable causes. Hence we come to the question, How can we prevent accidents?

All railroads represented here are going concerns with organizations more or less perfect, and the nearness to perfection of the organization of any railroad can be determined to a certain extent by the percentage of its gross receipts which is paid out in the settlement of claims. This amount, however, may be decreased materially by the diligence of the person in charge of the operating department in securing at once all information possible about all accidents. Much valuable information is forever lost to the company by the neglect at once to secure statements from all persons who know anything about each accident and the circumstances leading to it.

Tact and good judgment should be exercised in approaching the injured party and in adjusting matters with him before the arrival of some one of the many gentlemen who practise law and whose principal business is to secure a claim against corporations by promises of large financial returns to the injured. Once having secured the client, they will find "evidence," either in his testimony or in that of a willing witness, which will justify the submission of the case to a jury. When this has been accomplished the attorney of the corporation is confronted by the claimant, who looks weak and wan, apparently suffering from all the ills that flesh is heir to, although none of them existed prior to the accident. In such cases, as a rule, the jury seeks to comfort the claimant with a large verdict, forgetting all about the facts and circumstances of the accident as described by the witnesses for the railway.

Many of the accidents which occur on electric railways can be averted if each superintendent knows how to deal with the men under him to get their co-operation, and if he has a thorough understanding of human nature in general. He should see that all of his assistants are broad-minded men, that no petty jealousies are allowed to exist and that every man whether he is trackman, car cleaner, carhouse man, motorman or conductor, is made to feel that he is an important factor in the operation of the property and that any negligence on his part may lead to injury and loss of life as well as damage to property.

In my judgment, the greatest responsibility rests upon the transportation department, for that is the one which comes into direct contact with the traveling public. The courtesy which is exercised by the platform men goes much further in helping the company than they are likely to realize. The little kindnesses are of inestimable value in making patrons feel that the trolley company is something to be encouraged rather than abused. Thus the transportation department can build up a following which will assist the claim department as willingly as the employees, instead of leaving the railway at the mercy of the claimant.

Discourtesy on the part of motormen and conductors is equally far-reaching. It requires but little effort by very few of the employees to build up a sentiment which is antagonistic to the interests of the company. Hence the necessity for untiring vigilance by the superintendent to eliminate undesirable employees, and for care in selecting new men.

A large part of the public is always willing to note the demerits of the company and its employees and to proclaim its shortcomings upon the slightest provocation. The persons so inclined usually find a sufficient number who are willing to listen and sympathize with their grievances. These talks make a lasting impression on the minds of many of the complainant's hearers. Often we find that a person who has never had any direct cause of complaint, but who has listened to the grievances of some friend, later on is impaneled for jury duty. While undergoing the examination of counsel he will answer all questions satisfactorily, yet away back in his mind there is lurking the story that has been told him of the discourtesy of some railway employee. The result is that the testimony of an honest and courteous employee as to the occurrence under scrutiny receives little consideration at his hands.

The feeling should prevail that the foremen, superintendents or higher officers court suggestions from the men who are doing the work in the field. Such suggestions should not be thrown into the waste basket, or, if oral, let in at one ear and out of the other. They should be considered and if found practicable the man who made the suggestion should be complimented for his thoughtfulness and attention to the interests of the company.

The hearty co-operation of the heads of all departments is needed. Enlist the support and approval of the individual employee, that the method and manner of doing the work may be the best. When you have secured his co-operation and assistance keep it. Human energy will wane if not encouraged. The stimulant to be administered is the universal knowledge that no oversight or neglect on the part of any individual will escape unnoticed and that just discipline will be administered therefor.

REPORT OF THE TRAFFIC COMMITTEE

BY R. M. COLT, CHAIRMAN; B. E. WILSON, SECRETARY; C. R. GOWAN, C. H. ARMATAGE, J. W. NUGENT, F. C. YOCKEY AND C. E. HOLMES

The traffic committee submits herewith its final report in connection with the skeleton forms of the various passenger tariffs, as required by the Interstate and Public Service commissions, which were presented to this association at its last December quarterly meeting.* To bring up to date the skeleton forms already submitted we present at this time a supplement to the December report of the committee.

We desire to call your particular attention to the matter of charging for "excess valuation" on baggage. Most of the steam railroads throughout the country are now making

TABLE OF CHARTERED CAR RATES

HEAD LINE NOS.	HEAD LINE LETTERS / FROM / TO		A Washington, N. Y.	B Adams, N. Y.	C Jefferson, N. Y.	D Madison, N. Y.	E Monroe, N. Y.
			$ c.	$ c.	$ c.	$ c.	$ c.
1	WASHINGTON, N. Y.	One Way	.....	20 00	25 00	30 00	35 00
		Round Trip	.....	25 00	30 00	35 00	40 00
2	ADAMS, N. Y.	One Way	20 00	.....	15 00	20 00	25 00
		Round Trip	25 00	.....	25 00	30 00	35 00
3	JEFFERSON, N. Y.	One Way	25 00	15 00	.....	15 00	20 00
		Round Trip	30 00	25 00	.....	25 00	30 00
4	MADISON, N. Y.	One Way	30 00	20 00	15 00	.....	15 00
		Round Trip	35 00	30 00	25 00	.....	25 00
5	MONROE, N. Y.	One Way	35 00	25 00	20 00	15 00	.....
		Round Trip	40 00	35 00	30 00	25 00	.....

Suggested Form for Table Showing Chartered Car Rates

a charge for the excess value of a passenger's baggage over $150, and we feel that it is desirable, particularly in view of the recent court decisions, which were rendered in accordance with the public service commissions law fixing the valuation of passenger's baggage for which railroads are responsible, for our member companies to adopt a similar schedule for the transportation of baggage valued in excess of this amount. The committee, therefore, recommends that the stipulations as to the value of passenger's baggage and charges for excess value shown in the following supplement be included in all tariffs.

SUPPLEMENT TO THE DECEMBER REPORT

"Amendment to arrangement of contents of a local tariff, page 11: An additional section, reading 'Statement of Cash Fares,' should be inserted between Sections 7 and 8 on this page.

"Amendment to paragraph 1, Section 5, page 13, of committee's recommendation. This section should read as follows:

"BAGGAGE LIABILITY

"(a) Subject to limitations shown in Section 2, paragraph 'j,' 150 lb. of baggage, not exceeding $100 in value, will be checked without charge for each adult passenger, and 75 lb., not exceeding $50 in value, for each child traveling on a half ticket (unless a lower limit of value is shown in tariff announcing fares), except as follows:

"(b) On baggage carried between two points in New York State, not requiring transit through another state,

*See ELECTRIC RAILWAY JOURNAL, Dec. 16, 1911, page 1240.

the limit of value of baggage carried without charge will be $150 for each adult passenger and $75 for each child traveling on a half ticket.

"(c) When baggage is checked on a commutation or family ticket, the limit of value of baggage carried without charge will be $50.

"(d) No baggage will be transported in connection with low-rate excursion tickets where tariff announcing fares so states.

"Amendment to paragraph 2, Section 5, page 13:

"(a) The minimum rate will be 10 cents per $100 and the minimum charge for increased valuation 25 cents.

"(b) Charges for declared excess valuation must be prepaid and excess baggage check issued showing declared value and amount collected.

"(c) Before issuing a check for a piece of baggage, the party (whether he is the owner or not) presenting the baggage must be asked: 'Do you wish to declare any valuation in excess of $100?' If a greater value is stated than shown in paragraph 1, clauses 'a,' 'b,' 'c' and 'd,' collection must be made for excess value and signature secured on

TABLE OF ONE WAY TICKET FARES
(IN CENTS)

SIDE LINE NUMBERS	HEAD LINE LETTERS / FROM / TO	A WASHINGTON, N. Y.		B ADAMS, N. Y.		C JEFFERSON, N. Y.		D MADISON, N. Y.		E MONROE, N. Y.		F JACKSON, N. Y.		G VAN BUREN, N. Y.		H HARRISON, N. Y.		I TYLER, N. Y.		J POLK, N. Y.	
		Adults	Children	Adults	Children	Adults	Children	Adults	Children	Adults	Children	Adults	Children	Adults	Children	Adults	Children	Adults	Children	Adults	Children
		C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.	C.
1	Washington, N. Y.			5	5	6	5	9	5	11	6	14	7	*16	8	18	9	21	11	*23	12
2	Adams, N. Y.	5	5			5	5	5	5	6	5	9	5	11	6	13	7	16	8	18	9
3	Jefferson, N. Y.	6	5	5	5			5	5	5	5	8	5	†10	5	12	6	15	8	17	9
4	Madison, N. Y.	9	5	5	5	5	5			5	5	5	5	7	5	9	5	12	6	14	7
5	Monroe, N. Y.	11	6	6	5	8	5	5	5			5	5	5	5	7	5	*10	5	12	6
6	Jackson, N. Y.	14	7	9	5	10	5	7	5	5	5			5	5	†5	5	7	5	9	5
7	Van Buren, N. Y.	*16	8	11	6	†12	6	9	5	5	5	5	5			5	5	5	5	7	5
8	Harrison, N. Y.	18	9	13	7	15	8	12	6	7	5	†5	5	5	5			5	5	5	5
9	Tyler, N. Y.	21	11	16	8	17	9	14	7	*10	5	7	5	5	5	5	5			5	5
10	Polk, N. Y.	*23	12	18	9	21	11	18	9	12	6	9	5	7	5	5	5	5	5		

* Indicates increased fare.
† Indicates reduction in fare.

Table Showing One-Way Fares Suggested by Traffic Committee

back of agent's stub of excess check. If no value is stated, duplicate baggage check must be stamped (in space provided for route) 'Value asked and not given.'

"(d) Before ordering forward from other stations baggage which passengers forget to recheck, in addition to ascertaining number of passengers, route traveled, etc., the above question must be asked as to value, viz.: 'Do you wish to declare any value in excess of $100?' If excess is stated, make necessary collection, issue excess check and secure passenger's signature on back of agent's stub, sending strap and duplicate portions of excess check to general passenger (or baggage) agent, first train. If no value is declared, so stamp duplicate check held by passenger.

"(e) Failure to comply with these instructions will subject the company to a greatly increased liability, and each employee whose duty it is to check baggage is urged to co-operate by not failing in any single instance to ask the question in the words given herein, and be ready to testify if necessary that any check stamped 'Value asked and not given' by him is positive evidence that the question was asked and no value stated.

"(f) Under no circumstances must check be so stamped unless the question is asked.

"Amendment to paragraph 'a,' Section 6, page 14: The following should be inserted after third sentence in above paragraph: 'Children over twelve years of age will be charged adult fare.'

"Amendment to page 26: An additional section should be inserted between Sections 5 and 6 showing schedule of cash fares, which fares should include an excess charge of 10 cents when fare is paid on car or train.

"Amendment to paragraph 1, Section 6, page 26: The following should be added to the above: 'Children over twelve years of age will be charged adult fare.'

"Amendment to paragraph 1, Section 7, page 27: The following should be added to the above: 'Children over twelve years of age will be charged adult fare.'

"The committee also recommends that, inasmuch as the commissions permit the issuance of a loose-leaf tariff, all tariffs of any great number of pages be issued in this form. This will obviate the necessity of reprinting an entire tariff when changes are desired which will affect only certain pages. Pages containing corrections should be issued as a supplement to such loose-leaf tariff, and the following notation should appear at the top of the page, in the center, above the margin: 'Supplement No.— to page No.— of P. S. C.-2 N. Y. No.—.' The same notation should appear in connection with the issuance of a supplementary page to an Interstate Commerce Commission tariff.

"After a year of study wherein the work of the committee has been gone over very carefully with some necessary revisions we now feel that with the report submitted above and the supplement to the skeleton form presented herewith we have completed the work, as outlined by President Choate and the executive committee, of providing a complete set of skeleton passenger tariffs, which are compiled strictly in accordance with the rules and regulations of the Interstate and Public Service commissions, together with recommendations as to various matters pertaining to the transportation of passengers and their effects which it is thought will be to the interest of member companies to follow generally.

"In conclusion, the committee wishes to state that it received much valuable help and counsel from the Public Service Commission of the Second District and the Interstate Commerce Commission."

ADVANTAGES TO BE GAINED BY MEMBERSHIP IN THE ASSOCIATION.

BY W. J. HARVIE, J. G. WHITE & COMPANY, INC.

I cannot hope to present to the members of this convention any really new thoughts on the subject of the advantages of membership in the Street Railway Association of the State of New York, for each one of you, at one time or another, has had the same thoughts which I shall bring to your attention. I hope, however, that I may be able to show you the value of the association from a slightly different angle from that at which you may have considered it heretofore. What I shall say I believe to be the viewpoint of those of us who have entered the field of electric railway work, with a firm desire to succeed if attention and effort will accomplish it, and who have had the privilege of attending the association meetings and know what activity in committee work will do for one.

There are two phases of the question of value of association membership. One is educational and one is commercial. These resolve themselves readily into three distinct and important advantages to the membership: First, perpetuation of the industry by means of sound and dignified operating methods; second, commercial profit of member companies; third, education of the individual in order to accomplish the first two.

You will see at once that these three are very closely related—in fact, are to a large extent interdependent—and it is toward these that the various specific benefits all lead. The first and the last of these three might be called the humanizing influence in the commercialism of the railway business, and the second one the commercial side of the case. Either of these influences is worthless alone. The former alone would be unprofitable financially and the latter alone would make this old world of ours a sorry place in which to live.

Most of the real work, after all, is done through the hu-

manizing influence I have mentioned. Commercialism may be the immediate consideration that eggs us on, but the real work is done through the human-nature side of the case. The privilege of enjoying the acquaintance in business and pleasure of other men engaged in the same industry is the main factor to be reckoned with.

I think you will agree with me that the close relationship between members established and fostered by the Street Railway Association of the State of New York has been productive of more real and lasting good than any other one thing.

Now, when I say "real" good, I mean not only the direct results to be gained in esprit de corps, but also the actual, though somewhat intangible, good which is evidenced in the operation of our properties. Possibly we may not be able to trace a definite number of dollars and cents to this cause, but the effect of active association work is always felt throughout all departments of a property whose representative men are attendants at the various quarterly and annual meetings of our association and are active in its work. I make no exception to this statement. I include membership of all kinds—active, associate and allied—not forgetting that the latter, as well as our active and associate membership, are beneficiaries by their co-operation and assistance in our problems; and it is safe to say that many of the physical economies now in vogue are the result of the working out of our difficulties jointly and of a thorough understanding of our problems by all concerned.

RECRUITS IN THE RANKS

The ranks of efficient and successful railway operating men must be recruited constantly as our predecessors move into larger work. No one of us has all of the knowledge required to train properly the various sorts of men for all departments of our many-sided industry. Assuming, then, that our association contains successful men as well as some who are ambitious for success, and that the former are active in association work, could there be a better environment in which to place a young man who has chosen our industry as his future field of labor? Could we do better than to allow—yes, even insist—that he attend all meetings where he may come in contact with these leaders in our business of serving the public? If we do not encourage this, his viewpoint is narrowed down at once to the horizon of his own property with its own local coloring and methods. If we do encourage it intelligently, his viewpoint is broadened at once, and he begins to study his own methods and business shortcomings, in order to increase his capacity and his ability. This is highly educational and profitable and leads directly toward the points for which we are striving. We cannot value too highly the training given voluntarily by successful men under such agreeable conditions.

Opportunities like the above, properly assimilated, must make for improvement in the individual, efficiency for his company, and finally and unavoidably the betterment of the industry.

Let us take for illustration a young recruit who has selected the electric railway as his future field of endeavor and has been fortunate enough to secure employment at the bottom of the ladder and follow for a moment his probable course and its effect on his company's business. He has been in the service a suitable length of time, depending, of course, upon his job, the local conditions obtaining on the property with which he is connected and, last but not least, on his own personality and ability as demonstrated since employment. During this period his viewpoint is absolutely defined by contact with the man under whose direct supervision he may be and with his fellow employees. Both of these points of contact are very essential and sufficient for this period of his training. He has ambition, however, and, as his foreman or the department head finds this out and increases his responsibility, he begins to need some further insight into the business. Some of this he obtains by diligent reading of the various journals which keep in touch with all departments, but his personal observations are still made through the optics of his chief, supplemented occasionally as he progresses and has more responsibility by a word or two with the general manager or other local executive officer of the company. This functionary, however, would represent the extent of the horizon for our recruit if it were not for our Street Railway Association. He has read all the reports of its meetings and digested as well as he may the papers and discussions given in the various journals, and has perchance become possessed of a bona fide copy of the proceedings, to which he refers frequently. He is beginning to have some ideas of his own and wants to talk with some other men whose experience has either been like his or totally different from it, as the case may be.

Personal contact is what he now wants and needs, in order to improve himself further. He probably has not analyzed it in that way, but that is the fact nevertheless. He has become possessed with the desire to get something which he feels is not available to him in his present station. Is not this the very best thing that could happen to our young man? He is, let us say, a good employee and one whom we desire to keep in our organization. We are not narrow and should like to see him advance. Could we, then, do better than to give him the opportunity he so much needs? Let me say to you, gentlemen, that this is the crucial time for our recruit. We should send him to the first quarterly meeting that occurs and note the improvement.

After attending this our young man takes a keener interest in railway affairs and in his own department in particular. He took no active part at the first meeting, to be sure; was more of a spectator than a participant, but nevertheless he became partially acquainted with some others who were co-workers with him, and found that they as well as he had problems to solve. He found furthermore that their solutions were in most cases different from his and in some cases much better.

The result of this discovery is immediate. The company, no matter what its size, begins to profit commercially, provided, of course, that the efforts of our young man are encouraged and guided properly, and, in addition, he himself becomes more valuable. He absorbs readily that which he has learned to select as worth while and in turn gives freely of his experience and thought in order that he may add his quota to the progress of our industry. He is now well started and is in a fair way, if he is of the right sort, to become a useful member of our association and be a credit to it.

DEVELOPMENT OF THE RIGHT POINT OF VIEW

I think, gentlemen, if you will turn back the pages of your memory you will find that the above picture represents, in substance, about the process that we all have to go through, which has come under your observation many times; but now, if you will look a little way into the future with me, I think you will agree that this process, in some form or other, must be a continuous one if we are to keep pace with requirements of the business and develop through the actual industry those men who must carry on the work of the future. In no other way can there be instilled as effectively the right viewpoint.

The electric railway of to-day occupies such a position in the public eye that it is most important that its policy shall be one of straightforwardness and broadness, so much so that it becomes at once essential that those who have striven so long to carry the industry in the front rank and have upheld the integrity and honesty of purpose which should characterize a business so necessary to the public welfare should give of their knowledge, through the training school of personal contact in our association, to those who must be the standard bearers in the future. Gentlemen, the responsibility of a successful man does not end with his success. His neighbor and the industry both appreciate his voluntary

contribution from his experience and profit by it to the utmost, the more so in view of the fact that, contrary to the common belief that it is necessary to pay cold cash for a privilege in order to appreciate it fully, we find that railway men who are interested enough to attend our meetings seem to realize the privileges far more than the average in other lines of work.

In these troublous times, when political situations, both state and national, shift so readily and the public pulse is one of unrest, it is well that through such associations as ours the industry shall be kept to its true course. Matters may be discussed here thoroughly and openly and proper and safe methods devised to maintain an unwavering course both in our work and before the public, so that adverse criticism may not be brought upon the association and its officers and through them upon its members and the industry at large. I believe, gentlemen, there is no better or more efficient way to accomplish this than through the medium of meetings such as this one and our quarterly meetings, where personal contact with men of open mind and broad policies is close and whole-hearted.

We shall find that, whether our viewpoint be that of industry improvement, individual personal improvement or commercial betterment obtained through improvement in our operating methods, the expenditure in time, energy and money which association activities require is repaid amply to the participant, whether such participant be a company or an individual.

THE BANQUET

The banquet, which was held on Wednesday evening, with more than 200 delegates and guests in attendance, proved a splendid success from both the serious and the good-fellowship side. The speeches of Messrs. Whitridge, McCarter and Duffy were thorough discussions of the problems which confront electric railways to-day in their relations with the public and its creature, the government. The entertainment committee, under the leadership of J. P. Barnes, the versatile Syracusan, had something new to offer in the form of a "Him" book, a complete collection, with appropriate cartoons, of the clever verses which had been brought forth during the past two years, to celebrate in song the conspicuous qualities of prominent members.

President Choate spoke briefly at the conclusion of the dinner, which had been opened with a prayer by the Rev. Dr. Cracknell, expressing his pleasure to see the interest in the association manifested by so splendid a gathering. It was true that some old friends were not present this time, but he hoped that some day they would return to the fold. He had received two telegrams of regret, one from C. F. Sims, vice-president Delaware & Hudson Company. The other, which was dated at Hampton, Va., was from C. Loomis Allen, who had done so much for the association in the past, and who now telegraphed his earnest wishes for its future success. President Choate also announced the unavoidable absence of Frank W. Stevens, chairman Public Service Commission, Second District, New York, who was to have been the first speaker. Mr. Choate said that the up-State electric railways were fortunate in having to deal with such a man as Mr. Stevens, in whose integrity and ability they had the highest faith. He then introduced the first speaker, F. W. Whitridge, president Third Avenue Railway, as one who had given much study to public service commission matters.

MR. WHITRIDGE'S ADDRESS

Mr. Whitridge first expressed his opinion that there was no danger of the triumph of socialism in this country. A great deal had also been said recently about Cæsarism, but he believed its chief characteristics were a slavish fear of government officials and a disposition to run to the government with and for everything. In criticism of the State Board of Tax Commissioners he stated that that board had assessed the value of the franchises of the Third Avenue Railroad at $18,000,000 and the company was taxed on that sum, but that another body, pretending and illegally proposing to put a value upon the same railroad property, had omitted the $18,000,000 from the valuation because a recent statute prohibited franchises from being capitalized. The company had litigated the assessment for ten years and finally secured a ruling from the State Court of Appeals reducing it one-half, but the board continued to make the same assessment as it had made before the Court of Appeals rendered its decision. Mr. Whitridge also criticised the Public Service Commission of the First District. He said that the Public Service Commission for the Second District was, so far as he could judge, an honest, conscientious, reasonable and intelligent body. The Commission for the First District, he said, was an honest and conscientious body.

The last report of the Commission for the First District which he had seen issued stated that its staff consisted of 614 persons and its expenses during 1911 were $1,300,000. The expenses of the Commission for the Second District were $390,000 a year. The First District Commission had an engineering staff of 344 persons, whereas the Panama Canal Commission, which was undertaking the most important engineering work ever conducted, reported its engineering staff to consist of only 247 persons. The Commission for the First District, he understood, justified its staff on the ground that there were a large number of subways under construction, but, so far as the speaker knew, there were not enough subways under construction to justify the employment of forty masonry inspectors, as shown by the commission's last report.

He also said that the Commission of the First District had a passion for issuing orders and up to a year ago had issued eight times as many orders as the up-State commission, and he did not know how many more orders than the Interstate Commerce Commission. It also had a passion for writing long opinions. The commission took seventy-one pages to reject the plan of reorganization of the Third Avenue Railroad, although the Court of Appeals had smashed this opinion in fifteen pages. The Supreme Court of the United States had disposed of the legal tender case, including abstracts of counsel's arguments and dissenting opinions, in forty-nine pages and had lately decided the tobacco case and the Standard Oil case in opinions of from forty-five to fifty-five pages.

Mr. Whitridge also condemned the interpretation of the law by the commission. It had brought ten suits against him and had been defeated in all of them. It had tried to usurp the powers of the Board of Health and had been defeated and the powers of the Board of Estimate in respect to franchises and had been defeated. Now a member of the commission had recently read a paper in Chicago advocating that the control of the courts over the public service commission should be abolished.

In conclusion, Mr. Whitridge urged those present, if they wished to avoid Cæsarism, to think, speak and act like free men even to government officials. One must never forget also that it is impossible to get rid of the human element in the administration of government affairs. He believed with President Hadley that "the remedy for most of these evils is not by statute but in practical ethics." Finally, he said that complete publicity afforded a solution for the evils for which commission regulation was instituted.

MR. MCCARTER'S ADDRESS

The next speaker was Thomas N. McCarter, president Public Service Railway of New Jersey and president American Electric Railway Association, whom President Choate described as a man who had given more of his personal time for the advancement of the association than the executive of any other similar organization, and also

as one who had done more than any other single man to improve the lay public's knowledge of the financial problems now confronting the electric railways of this country.

Mr. McCarter began by briefly referring to Mr. Whitridge's remarks on socialism and Cæsarism, and said that, speaking neither as a Republican nor as a Democrat but as a citizen, he thanked his God that the Bonapartist, Robespierrean effort of "the Man on Horseback" to ride into power for the third time had been squelched at Chicago last week. However, he would say a word of cheer for association purposes. Referring to his recent trip, he said that it was not an easy thing for some half dozen men to leave their businesses to go the length and breadth of the country for six weeks, preaching the gospel of the work of the American Electric Railway Association and trying to bring not only the railway men but all the people in the various communities visited to a proper realization of the financial problems of public service corporations. In brief, the object of the trip had been to engender a better feeling between the people and the electric railway industry. He could not estimate just how much good had been accomplished, but he believed that there was many a man in the South, in California, in the Northwest as far as Vancouver and all through the Middle West who had come to have an entirely different appreciation of public service problems because of the association visit. He had not started on the nation-wide trip full of confidence that the electric railway interests were in a very healthy state. He had returned with the same feeling, namely, that the industry was in a very serious state because most of the electric railways were trying to sell their goods below cost. There were three fundamental things that threatened the industry in this country, as follows:

First, was the demagogic idea which pervades the country that because a public service business is such the return should be limited to a savings bank interest upon the investment. If that doctrine was to become the settled law of this land, electric railway development would cease, because men would not invest money in a business so full of hazards and annoyances if they were to be deprived of the fruits of their work. He would not undertake to say what a fair return should be, but if it was to be limited to 6 per cent he would invest his money in bonds and mortgages at 5 per cent or 6 per cent, or in savings banks at 4 per cent, without having any cares or worries thereafter. The public must be made to understand that there is a ground between capitalization and promotion, that it must stand for more than bank interest returns upon the investment and that communities can expand only as fast as their public utilities do.

Second, a constant effort was being made further to impair the finances of electric railways by getting them to do something for nothing, namely, to dilute the 5-cent fare by transfers, school tickets, six tickets for 25 cents, extension of average length of ride through the annexation of suburbs, etc. It was now far more accurate to speak of a 3½-cent or 4-cent instead of a 5-cent fare. The 5-cent fare was an anomaly and practically unknown to street railway practice in Europe. Parallel with this dilution of the 5-cent fare went increases in the cost of labor, materials and even of the money which had to be borrowed for electric railway construction. This could not go on much longer. A committee of the American Electric Railway Association was to make a thorough analysis of this phase of the problem, but the New York railway men should begin at once to preach the truth on this subject to the people of their respective communities.

Third was the franchise question. It had become the fashion to limit franchises to periods like twenty years. It was impossible to finance substantial enterprises upon such a short-lived basis. It was hard enough now to get money without the added burden of amortization charges spread over but twenty years. Some people might be willing to gamble on such a proposition, but it had not worked out well in the cities of Cleveland, Detroit and Toledo.

Mr. McCarter said that he did not object to a commission that was free from the clamor of the mob. For instance, as he understood the situation, such a commission as that of the Second District, New York, was a help rather than a hindrance. As Grover Cleveland had said: "We are confronted by a condition and not a theory." If the communities wanted to see their properties developed on the basis of "Live and let live," the railways would do their part. Nobody wanted any more get-rich-quick, fly-by-night financing. Nobody wanted to turn the printing presses upon securities. All wanted a chance to carry on their business honestly. Electric railway men had nothing to be ashamed of as to the way they had been carrying on their business for the past ten years. They were no more to blame for the sins of the early promoters than the present-day public was to blame. If the American people recognized this fact, it would be for their own good, for the railway's good and for the good of the country which we all love.

MR. DUFFY'S ADDRESS

Mr. McCarter was followed by C. N. Duffy, vice-president Milwaukee Electric Railway & Light Company. Referring to Mr. Whitridge's comment that socialism had no foothold under prosperous conditions, Mr. Duffy said that he was afraid that Mr. Whitridge's kind of socialism must be different from the kind he knew, or that it was simply theoretical knowledge. To paraphrase Mr. McCarter's reference to the words of the late President Cleveland, Milwaukee had been confronted for two years by the condition and not by the theory of socialism. He ventured to say that there were as many dollars per capita to the credit of Milwaukee people as there were to those of New York, but for all that the socialists were elected and were in power for two years. He was very glad to say that a non-partisan combination had taught them the error of their ways, so that temporarily at least they were no longer confronted by a condition. In Milwaukee the average fare per revenue passenger, owing to the sale of reduced rate tickets, was 4¼ cents and not 5 cents.

Mr. Duffy believed that the Wisconsin commission was all that Messrs. Choate and Whitridge had described the commission of the Second District of New York to be. He did not know what the decisions would be in the four rate cases now pending, but he knew that the commissioners would deal honestly, intelligently and courteously with the facts before them. The Wisconsin commission had not spent annually more than $100,000, which was much less than the expenses of even the Public Service Commission for the Second District of New York. Mr. Duffy asked whether many daily newspapers really do reflect the general sentiment toward electric railway corporations when making unwarranted attacks upon them and misrepresenting their purposes. He was glad to note, however, that this condition was being rapidly improved.

Regarding the question of 6 per cent on the investment, Mr. Duffy pointed out that, owing to the capitalization methods adopted in the Cleveland case, the Cleveland Railway really was not permitted to earn more than 3 per cent to 3½ per cent, as its capitalization had been scaled down at the time of its reorganization. He agreed with Mr. McCarter that the electric railways were selling their goods away below cost. He knew that to be the case in Milwaukee. Under present conditions he did not believe there was an electric railway, certainly not among city systems with suburban extensions, that was giving good service, maintaining its equipment efficiently and properly safeguarding its investment and yet earning 6 per cent on a 5-cent fare.

MR. REED'S SPEECH

The last speaker was Walter Reed, of Schenectady. Among many other amusing remarks, he said that all in Schenectady were now socialists, but he was living in hopes that socialism, like vaccination, would not come twice in the same place.

President Choate concluded the banquet with the cheering remark that all would agree that on this night at least the electric railways of the State of New York were in healthy condition.

MEETING OF THE COMMITTEE ON COMPANY SECTIONS

A meeting was held June 25 in New York by the committee on company sections of the American Electric Railway Association. Those present were C. N. Duffy, chairman, Milwaukee; R. E. Danforth, Newark, N. J.; J. E. Duffy, Syracuse, N. Y.; R. J. Clark, Kansas City, Mo.; H. W. Blake, New York, and D. F. Sherman, Providence, R. I. General George H. Harries, Louisville, Ky., and Past-president James F. Shaw were also in attendance. Those members of the committee who were unable to attend were W. R. Alberger, Oakland, Cal.; W. M. Casey, Denver, Col.; C. N. Black, San Francisco, Cal.; E. J. Cook, Rochester, N. Y.; P. H. Gadsden, Charleston, S. C., and W. G. Gove, Brooklyn, N. Y. Mr. Gove was represented at the meeting by Le Roy Ingoldsby.

Chairman Duffy, in opening the meeting, announced that two company sections had already been formed, one in Milwaukee and the second on the Public Service Railway, Newark, N. J. The Milwaukee section has about sixty-four members, and the company also has a company section of the National Electric Light Association with about the same number of members. The Public Service Railway company section has 187 members. Chairman Duffy also announced that W. M. Casey, of Denver, one of the members of the committee who were unable to be present, wrote that the Denver City Tramway was forming a company section and would apply for a charter. W. R. Alberger wrote that the San Francisco-Oakland Terminal Railways was forming a section, and P. H. Gadsden reported that the Charleston Consolidated Railway & Lighting Company was taking up the subject with other companies in South Carolina.

Chairman Duffy also sketched the general plan of company sections and the advantages of them to the association and to the company which has one. He said that the plan of the company section adopted is patterned a good deal after that of the National Electric Light Association. As a rule, a company section meets once a month except during July and August, so that it has ten meetings a year. Papers prepared by members on subjects connected with electric railway practice are presented at these meeting, and a discussion follows. These meetings give the ambitious men and the men with ideas opportunity of expressing themselves and teach them all to think clearly. In other words, the company section meetings are a national convention in miniature. Only a small fraction of the total number of employees of the railway company can obviously attend the national convention, but this plan of company sections has acted as a good substitute for those who were unable to attend the national convention. The advantages to the men are obvious. It not only gives to them a broader understanding of the needs of the industry as a whole and the new points of the other departments but it affords an opportunity to every one present to offer suggestions on improved methods of company operation. The advantage to the association is that it broadens its field of activity and the individual members of the company sections take more interest in the work of the association. It also increases the income of the association, because a member of a company section must also be an individual member of the American Electric Railway Association. As he is such a member he has all the privileges of other members of the association, and if he should go to an annual convention he could attend any of the meetings. Mr. Duffy added that some of the company members of the National Electric Light Association had offered as prizes for valuable papers or discussions at their sections the payment of expenses to attend the last annual convention of the National Electric Light Association at Seattle. Such a prize was very appropriate.

Continuing, Mr. Duffy said that owing largely to the introduction of the company sections the National Electric Light Association had grown in membership during the past year from about 3,000 to more than 12,000. Of this number about 10,000 are Class B, or company-section, members. He believed that the opportunities for company sections in the railway business were bigger and broader than in the electric light business. The task of looking after the work of the company section in Milwaukee was attended to by two committees, a membership committee and a program committee.

The committee on company sections then discussed the general subject and decided that there should be three kinds of company sections. The first would be that in which the company confined the membership to employees of its own company and conducted only a railway business, or wished a company section only of its railway employees. This would be the usual form of organization. A second form of company section would be where the company has, or desires also to have, a company section in some other similar association, like the National Electric Light Association. Here a charter would be issued by the American Electric Railway Association for a joint company section, and the dues only of these members who were engaged in the railway part of the work would go to the American Electric Railway Association. The third class of company section authorized was the combined company section. This kind of section would apply to small companies which believed that they did not have enough men in their own company to form a company section. They would then be authorized to form a combined company section with several other railway companies in the vicinity, if those railway companies were also company members of the American Electric Railway Association.

The committee also decided that dues from the members of company sections were payable in advance but that no member of a company section would be obliged to pay full dues of $5 oftener than once a year. The committee also decided to recommend to the executive committee that a gold medal should be offered yearly for the best paper presented before any railway company section. It was decided that the first period, if the plan should meet the approval of the executive commitee, should be from Jan. 1, 1912, to June 30, 1913, but thereafter that the periods should be for the twelve months ended June 30 of each year. The subject must be one dealing with electric railways and must be presented by a member of some company section. It was decided that the criterion upon which the paper should be judged would be the value which it was to the electric railway industry.

Subsequent to this discussion, the committee drew up a tentative constitution, as a suggestion to those who wish to form company sections, and decided on a form of charter, which the secretary was authorized to issue upon the organization of any new company section.

At the conclusion of the meeting Secretary Donecker announced that he would shortly issue a pamphlet describing in detail the advantages of forming company sections, the way to form them and containing the suggested form of constitution.

Final Hearing on Electrolysis in Chicago

A Statement by the Chief Engineer of the Telephone Company Relative to Work Done to Prevent Electrolysis—Also a Summary of Situation and Recommendations by the Chairman of the Electrolysis Committee

The discussion of electrolysis prevention in Chicago has now reached a point where practically all the evidence has been presented by both the city and the railway companies. At the meeting before the gas, oil and light committee of the Chicago City Council on June 21 J. G. Wray, chief engineer of the Chicago Telephone Company, informed the committee of the position his company was taking relative to the proposed ordinance and testified as to the approximate amount of damage attributed to electrolysis. In summarizing the work done by the telephone company toward preventing electrolytic action in the last few years Mr. Wray said: "We have known that all our underground cables have been exposed to electrolysis for a number of years. We have done all we could to protect the cables and prevent damage to them. We have made what we call electrolytic surveys continuously for nearly twenty years. In that way we have been able to protect our cables in fairly good shape. The railway companies have cooperated with us to a certain extent, permitting us to make connections with their system with the bond wires, thus throwing off the current from our cable sheaths. The annual cost of maintaining this inspection of our cable system is about $20,000 a year.

"Recognizing that some concerted action was necessary, about three years ago the engineers of the various public service companies got together and organized what we called an electrolysis committee. Bion J. Arnold, John Williamson, of the gas company, and myself were the first committee appointed, and after holding a few meetings we decided that the work had better be done by a sub-committee, and representatives of each public service company were appointed to work as a sub-committee. Later it was found wise to enlarge the sub-committee to include representatives from all of the public service companies and railways, and this was done.

"The work we have had done in the past to protect our cable plants has involved the use of bond wires, which in a sense are a drainage system, but one peculiar only to the telephone company's plant. Without the co-operation of the other companies, however, the protection of our plant was rather difficult, because changes in the plant of the other companies would necessitate changes in our plant. The gas company might bond its pipes and in so doing make the bond which we installed shortly before useless. That co-operation resulted in the development of a lot of facts and in the formulation of a theory that probably a drainage system would accomplish the best results immediately at a minimum cost.. That conclusion was not arrived at in a formal way. The committee was about to try an experiment with the drainage system, and it believed that the drainage system would be of great advantage in reducing the hazard to the underground metallic structures. As to the damage to our plant, we have an investment of between $6,000,000 and $7,000,000 in underground cables. I would estimate that the damage to the plant will be in anywhere from 1½ to 2 per cent. The damage is probably more than $100,000 a year, which would include the cost of inspection.

"With further reference to the drainage system, which, as I understand, is the bone of contention, I believe, as I have stated before the electrolysis committee and to members of the committee individually, that the drainage system is not the ultimate solution of this difficulty. I believe, however, that under the conditions prevailing here in Chicago it could well be adopted as a temporary expedient. In explanation of my belief, we all know that the traction companies and the Edison company are contemplating a combination which will make it possible to utilize all the power plants and substations of the three companies. The utilization of all these power plants and substations will automatically approximate the reduction in drop which we all claim is desirable if not absolutely necessary in the end; but the bringing about of that reduction in the drop from 25 volts to 12 volts now, without availing ourselves of all of these substations, will mean a larger expenditure than will be involved if this is done later when the substations can all be engineered as one plant. In the meantime it was my judgment—and it still is my judgment—that the drainage system applied will make for temporary relief and will carry us over until the ultimate solution can be applied."

DISCUSSION BY CHAIRMAN OF ELECTROLYSIS COMMITTEE.

At the conclusion of Mr. Wray's testimony, Ralph H. Rice, division engineer of the Board of Supervising Engineers, in charge of electrical transmission and distribution, and chairman of the electrolysis committee, summarized the Chicago electrolysis situation and gave the gas, oil and light committee his recommendations as to the proper method to pursue at this time. In order to put an analysis of the requirements of the proposed ordinance in terms which could be understood by the members of the committee, Mr. Rice compared it with a water supply system. At the conclusion of his comparison he said: "A statement has been made frequently, and particularly in reference to the Peoria electrolysis case, that the current takes the path of least resistance. That is not wholly correct. The current enters the rails from the car wheels. Most of it will flow on the rails and the return circuit provided for it, but it is not possible, except by insulating the rails, to prevent the flow of current into the earth. We must recognize the fact that from the very nature of a return system such as we have in our American cities, such as we have in Chicago, a certain amount of current will necessarily be shunted to the earth and cannot be eliminated.

"The fundamental object of the drainage system urged by the railways is to reduce as near as possible the potential difference between the rails, pipes and sheaths to zero, or at least to make the pipes and cable sheaths negative to the rail. Inasmuch as we cannot secure entire immunity from the pipes, that portion of the current which does get on the pipes must be provided for by a drainage system. Electrolysis will not occur if the current is led from metallic structures in such a manner that it does not flow from those structures into this moist earth. Electrolysis has done some damage, and it is very probable there will always be some damage done. The railway companies, I think, have not denied this fact.

"The ordinance sets forth certain requirements and provides means for enforcing them. The main purpose of the ordinance is, of course, to prevent the damage done by these stray currents. The provisions made to accomplish this result are in general three: First, the drop is limited to 12 volts between any point on the return system in the ordinance. This limit is nearly nominal, because a second condition comes in—the gradient is limited, that is, the rate at which the potential flows along the return system is limited to 1 volt per 1000 ft. within 1 mile of the city hall and 1 volt per 700 ft. beyond that limit. This limitation set up by the gradient is much more severe in general than the limitation of the 12-volt drop. The 12 volts specified in the ordinance is not the limit set on the voltage drop. The limit set is under the gradient. Probably the 12 volts will be the limiting condition in those districts

which are far away from the power stations. With the districts which are near the power stations the potential gradient will be the limiting condition.

"The railway companies claim, and have presented figures, that this gradient where it is limited to 1 volt in 700 ft. will mean under the ordinance an 8-volt drop. Where the gradient is limited to 1 volt per 1000 ft. it will mean a 4-volt drop, and in the business district, where the traffic is very heavy, it will be a 2-volt drop. I do not intend to analyze these figures, but I will merely state that the drop, whether those are the correct figures or not, will be far below 12 volts, which has been specified as the limit in the ordinance.

"A third limitation imposed is a limit set upon the allowable currents in the pipes and cable sheaths. First, the total leakage of current is limited to 10 per cent of the station output; second, the amount of current is limited upon the various structures according to the size of the material or pipes and cable sheaths. I think these limits are good, but remember this, that if the limitation of drop and gradient is sufficient as specified in the ordinance—and Mr. Palmer has argued here that the electrolytic damage would cease if you secured a low drop; he has argued that further protection of pipes, if you secure a low drop, will not be necessary—if this is really the fact, if the securing of a low drop and low gradient will actually secure the prevention of any leakage of current into the pipe and cable sheaths, then this clause concerning the limitation of current in the pipe is entirely unnecessary, as are also the instruments and the current-limiting devices which are specified to show that ordinance requirements have been fulfilled. On the other hand, if the limitation of drop and gradient is not sufficient to keep the current off the pipes, some means is necessary for taking the current from the pipes and sheaths safely; so that whatever way you look at it there is an inconsistency. If the drop and gradient will prevent the current from getting on the pipes, then this specification is unnecessary. If, on the other hand, the drop and gradient are not sufficient, then other means must be provided for adequately caring for the current which does escape.

"There is much advantage in having a good return circuit, simply because a larger proportion of the return current will flow in the circuit. It does not prevent leakage entirely. Any method that reduces the track drop is very desirable. Personally, I do not believe there is a better method of reducing the track drop than that suggested by Mr. Palmer. It is necessary to reduce the pipe current to the value that these pipes can carry safely; it is necessary to reduce the current to the point where it can be removed safely so as to prevent flow from the pipes to the ground.

"Furthermore, it is still good engineering to find a point to which it is desirable to increase the efficiency of the track circuit and beyond which it is not practicable to go, because the stray currents may be taken care of otherwise. We have, then, two means of procedure which have been very sharply defined here: first, to reduce the track drop flow, which is contemplated, as I understand it, by this ordinance; second, not to require anything more than reduction in track drop to care for the stray currents. This reduction of track drop may be accomplished in three ways. The first one is insulation of uninsulated cables, supplementing the track return. The second is the use of return cables supplementing the track return, using the booster or doing without the booster. The third method is an increase in the number of power stations, reducing the feeding distance and consequently reducing the amount of current which has to flow over any one track in returning to the station.

"The difference between these methods is dependent upon the original cost and the operating cost. The Board of Supervising Engineers chose the first method and has carried it out to what we consider its economic results—in other words, to such an extent that we believe the return circuit has been reduced to a value which makes it not economically feasible to go any further in that direction. Another method of reducing the drop is by increasing the number of substations, a method that will be used in Chicago as the traffic grows.

"Whatever method is used, the stray currents remain, and it is proposed to take care of these currents. One method that has been mentioned, the low track drop, does not eliminate the danger from electrolysis. It has been brought out that Mr. Palmer has found 13 volts maximum drop in the downtown district. He claims that even with this condition existing and with the drop of 13 volts there is electrolytic damage. It was brought out by Mr. Blair the other day that in the vicinity of the Van Buren Street substation the drop was limited to 4 volts, and that a considerable amount of damage was still claimed to exist. In other words, the bringing to the low return drop does not in itself eliminate the danger of electrolysis.

"The arguments in this committee have settled down to the choice between the booster system and the drainage system. There are certain things in favor of the drainage system and certain objections to it, and I will try to cover them very briefly: In the first place, I consider the drainage system is an engineering solution to the problem we have before us to-day. It is theoretically sound, and it has been used extensively. Even taking the figures that were furnished by Mr. Palmer, the drainage system can be put in for approximately 10 per cent of the cost of the booster system, and it is consequently within the range of financial possibilities. It can be installed in the entire city within six months of working weather, provided the funds are furnished.

"The booster is a special machine and will have to be made to order, and the method is new in this country. It will take far more time to install it; therefore, if you are looking for an immediate solution, the drainage system is the better. There has been some objection raised before the committee to the drainage system—first, that it causes more current to flow on the pipes: I think that is questionable. The indications have been in a great many cases that less current flows on the pipes when drainage systems have been installed; but, even granting that there might be an increase of current flowing on the pipes by the installation of a drainage system, it seems to me to be a sounder principle to control the large amount of current that will go onto the pipes rather than to allow a small amount of uncontrolled current to get onto the pipes and sheaths and leave them at will. In other words, the control of the current that is on the pipes and sheaths is the important thing in the installation.

"A second objection has been made that joint electrolysis is caused in the pipes. I do not believe that that contention will be upheld by the facts in Chicago. Joint electrolysis is not prevalent in Chicago, and I think that it is comparatively rare. There is, of course, a theoretical possibility, and it may occur at times, but I think the situation in Chicago is that it does not occur frequently. The only way we know that anything is happening to the pipes, or of any possibility of danger to the pipes, is by making observations. What can be done with one system can be done with another.

"Another objection to the drainage system is that it needs continual watching. So does the booster system, or any other system. In other words, if you think you can install any remedy for electrolysis in any place and go away and forget it, you are mistaken. Any system to be effective must be continually watched.

"A booster is a generator placed in an electrical circuit for the purpose of neutralizing the electrical drop in that circuit. A booster is connected to a return circuit; it reaches out to the point where the booster cables are attached to the circuit and draws the current from the track circuits. In other words, the booster drains the current

through insulated cables from the track circuit. A drainage system drains the stray currents that happen to get to the pipes and cable sheaths. Both systems are in common to the extent that they send the current back to the power station over insulated cables. The booster system returns the current from the track and rails and causes a reduction of track drop by that process. The drainage system takes off the amount of current which inevitably leaks to the pipes and cable sheaths without damage to them."

In conclusion Mr. Rice furnished evidence as to the standing of the drainage system by referring to the recommendations of the electrolysis committee and the Board of Supervising Engineers. He called the committee's attention to the Pittsburgh solution and the court's recommendations in the Peoria case. Paragraphs were also quoted from a paper presented at the Louisville meeting of the American Water Works Association by Prof. Albert F. Ganz, of the Stevens Institute of Technology, in which the drainage system was recommended. Portions of the report of the National Electric Light Association committee on underground construction was read, and communications from Brooklyn and Pittsburgh relative to the use of cable and pipe drainage systems were presented. In order to allow Mr. Palmer sufficient time to reply to Mr. Rice's argument the final session of the electrolysis hearing was continued until July 1.

COLLAPSE OF THE BOSTON ELEVATED STRIKE

The continuance of normal car service on all the lines of the Boston Elevated Railway Company during the past week marks the complete collapse of the strike declared by a small percentage of the company's car service employees on June 7. Of the 4600 men working in the transportation department at the inception of the walkout, a maximum of barely 1400 were persuaded by the labor union organizers to leave the company's ranks, and at every step of the affair the integrity of the company's position has been unassailable. Hearings were begun on June 27 upon the strike situation by the State Board of Conciliation and Arbitration, and it is expected that several days will be occupied in listening to the testimony of motormen and conductors who withdrew from their duties at the behest of the professional organizers in charge of the strike. The company declined to appear at the hearing, informing the board in a letter signed by President Bancroft that it does not wish to appear in opposition in the proceedings. In an interview with a representative of this journal on Thursday, Second Vice-president Matthew C. Brush stated that the company has absolutely no intention of receding from its position in any way whatever, and that the strike has become a dead issue so far as the company and the public are concerned. More men are at work and more cars are being run than before the walkout took place, and day by day the extra men employed are becoming more efficient and satisfactory additions to the personnel of the system.

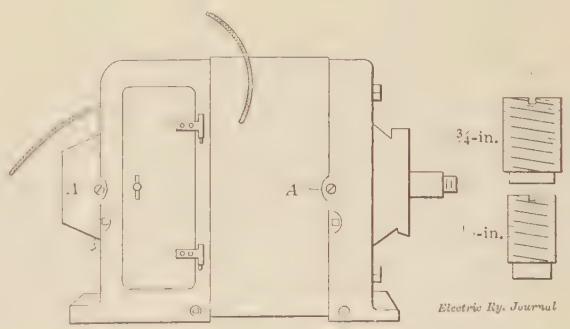
From the inception of trouble the company has maintained that its threefold duty is to render efficient service to the public, to pay as high a wage to employees as conditions will permit, and to earn a fair return on the capital furnished to perform the service. A policy of the utmost frankness has been carried forward, and public sentiment from the outset has been overwhelmingly in favor of the company. The co-operation of the police and the courts at the first signs of violence was thoroughly effective in reducing disorders, and the lesson of some 200 jail sentences ranging from three months to a year went home to the mark and effectually quieted the desire to create disturbances. A feature of the strike was the organization by loyal employees of the company of the Boston Elevated Fraternal Protective Association, to promote the continuance of existing cordial relations between the employees and the company and to protect the interests of both from outside interference. The loyal employees of the company made a strong stand before the public on the platform of being desirous of peaceably going about their duties, tolerating no interference from without and condemning the spreading abroad of the statement that the company's employees were on strike when more than two-thirds stuck to their posts in the face of great intimidation and vigorous efforts to secure disaffection. Not a single man in the power houses and shops of the company heeded the efforts of the strike organizers to cause a shut-down in these departments.

Practically all of the trainmen who withdrew from the service had been in the employ of the company but a year or two, and many were led into the strike without realizing the folly of their course. The company welcomed back into its ranks many former employees as soon as trouble began, and several hundred men who joined the followers of the union leaders in the ill-considered excitement of the initial strike meeting have applied to the company for re-employment. The company has refused to take back any employee found participating in violence of any kind, and all strikers returning do so on the basis of new men without rating. A large number of college students have joined the company's organization, and recruits to take the places of the strikers have been drawn from many other parts of the East and Middle West. Frequent bulletins issued by the company have found favor with the public through their clear statement of conditions, their emphasis upon the large amount of welfare work conducted by the road, and their straightforward statements of the company's aims and convictions. The local labor organizations have manifested little sympathy with the strikers, and there is little doubt that the company's position in the community has been greatly strengthened by the firmness with which it has maintained the position that outside interference with its affairs and particularly with its relations with employees is insupportable.

TIGHTENING COMPRESSOR MOTOR BEARINGS

BY GEORGE M. COLEMAN

On the D-2 Westinghouse compressor motors the set screws "A" which hold the bearing in place become loose, thus giving the bearing a chance to vibrate. In time this



Tightening a Compressor Motor Bearing

vibration will cause much noise and trouble. These set screws are ½ in. in diameter by 2 in. long. Only half of the hole in the motor frame is tapped out. The upper half is drilled out ⅝ in. When the bearings need tightening tap the upper half for a ¾-in. screw. Cut the original set screw in two and slot the top, as shown in the sketch. A ¾-in. screw with a small projection at one end is then made. Put the ½-in. set screw into place and then screw the ¾-in. screw tightly against it. This will make a perfectly secure construction.

Proceedings of the Saratoga Convention

The Principal Subjects Discussed at the Meeting in Saratoga Were the Advantages of Association Membership and Accident Prevention

The thirtieth annual convention of the Street Railway Association of the State of New York, comprising the usual full program of business sessions, a banquet with notable speakers and entertainment, was held at the United States Hotel, Saratoga Springs, on June 26 and 27. In accordance with the notice given at a previous meeting, the name of the organization was changed, following the precedent set by the national association, to the Electric Railway Association of the State of New York.

President J. K. Choate, Otsego & Herkimer Railroad, called the first business session to order at 11:10 a. m. on June 26. After routine preliminaries had been taken up Mr. Choate introduced N. R. Thompson, president of the Business Men's Association of Saratoga Springs, who extended a cordial welcome to the delegates and explained the points of interest in the village.

President Choate then read the annual address of the president, expressing his warm thanks to the members of committees and others active in the association who have contributed to its success in the last year. Mr. Choate's address was as follows:

Address of President J. K. Choate

With this, our thirtieth convention, we change our name (if I may anticipate your action) from the Street Railway Association to the Electric Railway Association of the State of New York, a most wise measure in the face of the great development and prominence of the interurban and suburban growth of our purely electric lines, not to speak of the general electrification of the terminals of the steam railways in all the large cities; for all electric operation should be represented in our association.

The past year has been one of general prosperity to our electric companies, and this in the face of the increasing tendency for legislative control and governmental investigation of corporate interests.

I do not wish to take too much to ourselves, but I do believe that the electric companies can show as great development in the art and in their operations as any other branch of public utilities, and that they have tried studiously and honestly to comply with the laws of the government and State.

Fortunately, and especially for those who report in the Second District of the State, we have had a commission in whose integrity and honesty we have unbounded confidence, although we may not fully believe in the law or always agree with its decisions, and I have the boldness to believe that the frank way in which we have always tried to meet the members of the commission has given them confidence in us—a fostered condition most gratifying.

Our association has had a prosperous and progressive year and has advanced steadily in the work for which it was organized. The quarterly meetings have been largely attended and the papers presented have been of the highest order and have provoked discussion of the greatest advantage to all.

All of our important committees have been continued and have done good work. The report of the rules committee of a year ago has been adopted generally and put in force, although these rules have not received the absolute approval of the commission, which was much desired. They represent the work of the best men in electric operation, not only of our own association but of the national association.

The report of the committee on the joint use of poles, submitted at our last convention, has met with approval by all parties interested, and it is hoped that a standard agreement will be in effect soon throughout the entire country.

The work of all other committees is to be commended for the patience and time given to this work by individual members and for the results obtained.

It is with great regret that I have to report the withdrawal from membership in the association of the New York State Railways of Rochester, the Syracuse Rapid Transit Railway and the Utica & Mohawk Valley Railway. It is not within our province to question the reason for these withdrawals, but it is safe to say that, regret it as much as we may, it will be a greater regret to these companies to be without the advantage of the association work.

I myself am the greatest believer in the association, in its work and in the intermingling of our men, giving opportunities for the free and unlimited exchange of views and discussions of all that is best and most advanced in our operations in all departments.

On this subject we are to have presented immediately, when we are through with the business part of our session, a paper that will cover the subject more thoroughly from a man who has always been foremost in the best work of the association.

Through the efforts of your officers new members to the association are assured, so that our numerical strength and our income will be maintained.

Our association should embrace in its membership every electric railway in the State, and it will be the work of our incoming officers for the coming year to attain this end, for in numbers is our greatest strength.

I can only hope for a reconsideration in the near future of the withdrawals we have received and a renewal of all old ties and friendships; but, be that as it may, the association is greater than individual membership and will continue to command the respect and influence that is its due.

I have to thank all those who have served with me in the past year for their hearty and generous work and support.

The executive committee did not make a formal report, but President Choate said that it had been in conference and in close touch with matters affecting the association during the year.

H. M. Beardsley, of Elmira, the treasurer, was unable to be present, and his report was read by J. C. Collins, the secretary. Mr. Collins then read the annual report of the secretary.

President Choate said that he had received a report of progress from C. L. Cadle, of Rochester, chairman of the committee on the joint use of poles. The committee is awaiting action on the subject by some of the electrical associations.

W. J. Harvie, of J. G. White & Company, Inc., New York, then read a paper on "Advantages to Be Gained by Membership in the Street Railway Association of the State of New York." This paper is published in abstract elsewhere in this issue.

Discussion on Mr. Harvie's Paper

W. H. Collins, Fonda, Johnstown & Gloversville Railroad, in opening the discussion on the subject of Mr. Harvie's paper, said that he agreed fully with the conclusions stated. The subject was timely, and the facts and suggestions advanced appealed strongly to the members of the association.

E. S. Fassett, United Traction Company of Albany, said that many of those present had been identified with the association a long time and they should appreciate the benefit which they received from their membership in

the early days. The younger men were coming up and should have the same advantages now that the older men had when they started. The advantages of membership were not only those afforded by the meetings but also those of making friends and of correspondence which followed. He had learned from the beginning of his connection with the association.

E. T. Peck, of Allen & Peck, Inc., said he would like to add his testimony to what had been said. He had spent thirty years in public service corporations and thought that the best points had come from association work. He had received great benefits from the meetings of the association.

J. Stanley Moore, of Syracuse, said that if any suggestions could be made that would help to enlarge the work still further they should be advanced.

Mr. Fassett said that the New York association was the first to take up the subjects of city and interurban rules and that it had led also in the consideration of other important matters.

President Choate, in referring to the importance of the work of committees in the association, said that the contract for the joint use of poles, representing the conclusions of the New York committee, promised to be one that would be adopted generally.

Axel Ekstrom, Delaware & Hudson Company, said that on general principles an association was of great educational value. If the association bent its efforts toward educational work it had his support. If the association could find some means of increasing net earnings of electric railways so as to overcome the continual increase in expenses it would accomplish a great work. This would help both the owners of the properties and the association. Young men must be found to take the places of the older men. It was necessary, however, to educate the young men and the association could be a great help in that direction.

J. C. Collins, of Rochester, said that the association had been effective in teaching the younger men how to state their point of view while on their feet. As an illustration of the interest in the work of the committee on the joint use of poles, he said that two letters had been received from Europe and many from places in this country asking for copies of the report of the committee and commending it.

The morning session was then adjourned.

TUESDAY AFTERNOON SESSION

The first order of business in the afternoon was the presentation by R. M. Colt of the report of the traffic committee, as abstracted elsewhere in this issue. The report was accepted, but it was decided to continue the committee in order to take care of any changes that might be required from time to time. It was announced that copies of the new skeleton forms could be obtained upon application to the secretary.

HIGH-TENSION DIRECT-CURRENT RAILWAYS

The next order of business was a paper by W. P. White, engineer General Electric Company, entitled "Extension of Direct-Current Railways by the Application of Higher Voltages." An abstract of this paper is printed elsewhere in this issue. Mr. White distributed a new publication by his company on the first costs, operating costs and maintenance costs of high-tension and low-tension d.c. railways.

In reply to several inquiries, Mr. White said that his company had installed 89,300 hp in high-tension d.c. equipment up to the end of 1911. He had heard of no electrolysis troubles on high-tension d.c. lines, and in all cases the high-tension sections were outside of city limits. The 1200-volt motor equipments did not require any added weight in the control or other auxiliaries. The only increase was due to the use of a dynamotor weighing 700 lb to 900 lb. Compressors were now being built for 1200-volt operation, so that it would not be necessary to run them from the dynamotor. The number of contactors did not have to be increased, owing to the development of a contactor which takes care of a bigger voltage than heretofore.

Continuing, in reply to questions by Messrs. Collins and Bagg, of the Fonda, Johnstown & Gloversville Railroad, Mr. White said that his company had as yet fixed no limiting voltage for high-tension d.c. equipment. It had already gone to 2400 volts. There was no more difficulty in collecting current at 1200 volts than at 600 volts, and practically the same trolley wheels could be used for either voltage.

DEVELOPMENT IN RAILWAY EQUIPMENT, MISCELLANEOUS BUSINESS, ETC.

The last paper at the afternoon session was one by K. A. Simmon, railway engineering division Westinghouse Electric & Manufacturing Company. An abstract of Mr. Simmon's paper appears elsewhere in this issue.

W. J. Harvie, engineer J. G. White & Company, New York, asked Mr. Simmon to what extent field control had been adopted, particularly for surface work. Field control appeared to him to have features of simplicity and efficiency.

Mr. Simmon replied that field control was in use on all the Pennsylvania locomotives in the New York terminal work and on a part of the New Haven equipments, while street car sets were in use at New York, Brooklyn and Los Angeles. The last city had been using six surface equipments successfully for about fourteen months. Hand-operated field-control equipments were as yet not employed extensively. Mr. Simmon added that his company now has in operation about 200,000 hp in high-tension railway apparatus.

W. H. Collins announced that the committee on the change of name of the association had recommended to the executive committee that the name "Street Railway Association of the State of New York" be altered to "New York Electric Railway Association." Upon motion, the meeting adopted the new name by a *viva voce* vote.

President Choate then appointed the following as a committee on nominations: E. F. Peck, E. S. Fassett and W. J. Harvie. The meeting then adjourned.

SESSION ON JUNE 27

When the meeting was called to order on the morning of June 27 telegrams expressing regret at their inability to be present were read from T. C. Cherry, C. R. Barnes and Howard McSherry.

President Choate called attention to the paper which Dr. H. L. Shaw, of Albany, had been expected to present before the meeting. Dr. Shaw was unable to reach Saratoga Springs in time for the meeting. He called attention, however, to a meeting of the International Congress on Hygiene and Demography to be held in Washington, D. C., on Sept. 16 to Oct. 5. One section of the congress will consider subjects relating to hygiene and ventilation of street cars. The New York Central & Hudson River Railroad will make a display of methods which it has adopted to prevent accidents. Among the speakers will be the following: Judson C. Clements, "Interstate Commerce Law in Relation to the Public Health"; Dr. W. A. Evans, Chicago, Ill., "Ventilation of Street Cars"; J. C. Hallack, Newark, N. J., "Sanitation of Street Cars."

President Choate then introduced the subject of discussion set for the morning, "Accident Prevention." He said this was the most important subject facing railway operators, whether steam or electric, at the present time. Much publicity had been given to the subject of accidents, with the result that drastic legislation was threatened. It was unfortunate that in the comparisons made between the numbers of deaths on railroads in foreign countries and in this country the differences between the methods of compilation of the figures were not explained. Although it was true that the number of accidents was larger in this country and that many accidents were due

to lax enforcement of laws, a comparison between operations here and abroad based upon the deaths of passengers only would be in favor of this country. Many of the comparisons had not separated the deaths of trespassers from those occurring to passengers. Nevertheless, the question of accident prevention would have to be met in the near future and Mr. Choate hoped that the subject would be discussed from every point of view.

W. B. Baker, attorney Fonda, Johnstown & Gloversville Railroad, then read a paper discussing the "Prevention of Accidents from a Legal Standpoint." An abstract of this paper is published elsewhere in this issue.

W. H. Collins, Fonda, Johnstown & Gloversville Railroad, said that a point to which Mr. Baker referred, the inspection of bridges on a road over which the company had trackage rights, brought out a new thought.

Mr. Baker said that the division of responsibility depended upon the contractual relations between the two companies.

W. H. Hyland, claim agent Fonda, Johnstown & Gloversville Railroad, said that the part of Mr. Baker's paper which referred to the inspection of cars was very important. Much could be done to protect the company by the employment of the kind of man who would see that proper reports were made. If the official who had charge of the cars was the right type of man he would so encourage the conductors and motormen to go to him with reports of defects that if a car was out of order they would continue to present the matter to him until it was fixed properly. Such an official should always invite the trainmen to go to him freely.

James McPhillips, attorney of the Hudson Valley Railway, then read a paper discussing "Prevention of Accidents from the Claim Agent's Standpoint." An abstract of this paper is published elsewhere in this issue.

President Choate said he knew every manager would agree with him that the paper read by Mr. McPhillips was as good as a lesson for, or criticism of, the superintendents as they had ever heard. A superintendent had to fill one of the most difficult positions in the entire operating organization of a railroad, but once in a while it was good to find someone to point out new ways for him to follow.

Arnold Von Schrenk, United Traction Company of Albany, said that it was important for the claim department to handle an accident so that a proper knowledge of the causes would be secured and a lesson drawn so carefully that the same kind of an accident would not be repeated.

C. J. McAleer, Schenectady, said there was no doubt in his mind that every accident of importance was investigated. A claim agent was willing to accept the trainman's report until contradictory testimony was received from the person involved in the accident. In the end, a thorough investigation would develop the facts. The claim agent sent the results of his investigation to the superintendent with a recommendation.

J. F. Hamilton, general manager Schenectady Railway, then read a paper discussing the "Prevention of Accidents from the Operating Standpoint." An abstract of this paper is published elsewhere in this issue.

President Choate said that he had invited Dr. Arthur W. Cutler, chief surgeon of the Otsego & Herkimer Railroad, to discuss the subject from the medical standpoint.

Dr. Cutler said that upon hearing the papers he was impressed by the fact that all of the officials were working toward the same end. Accidents, however, should be prevented by an exercise of great care in the selection of employees. There were a few points that he thought all should remember. Trainmen should have normal acuteness of vision. A man without normal vision was not satisfactory for a position on the front end of a car. As far as hearing was concerned, trainmen should be able to hear an ordinary watch at a distance of 3 ft. Consideration of the color sense also was important. On one road, it was found that 5½ per cent of the applicants were deficient in color sense. Such a man had no business at all in the employ of a railroad. Even if employed as a cleaner of a station he might be left in charge there while the operator was at dinner. This was the one occasion when, with the responsibility resting upon an inefficient man, an accident might take place. It was not absolutely necessary that every man should be a perfect figure of health, but it was essential that he should be normal in these respects. A keen man in the employ of a road could be so trained that with care he could locate any trainmen who were deficient in color sense, sight or hearing. After an applicant had been accepted he ought not to work on the road for a lifetime without occasional further examination. Re-examination should take place ordinarily about every three years, but it was also important to have one made after an acute illness, after an accident, or if an employee had alcoholic tendencies.

Walter Sicard said that while he was a conductor he had learned that it was important to tell all the simple details bearing upon an accident.

John Sibbald, Fonda, Johnstown & Gloversville Railroad, said it was important that employees of railroads should have their attention called to the danger of the employment in which they were engaged.

E. F. Peck, Allen & Peck, Inc., said that the papers on the subject were as thorough as any the association had heard for years. He suggested that they be published in pamphlet form and distributed to the members. He asked Dr. Cutler what other tests were made besides those for hearing, sight and color sense.

Dr. Cutler said that most railroads made a thorough examination. After testing sight, hearing and color sense they required the applicant to strip for a complete physical examination, which could be made very quickly. Little defects, such as the loss of a finger, would not always be designated as hindrances to employment. The question of the mental capacity of the applicant was not considered by the medical examiner and it was the duty of the transportation department examiner to consider this. He did not know how the medical examiner could tell whether an applicant would be careless or careful.

W. J. Harvie, J. G. White & Company, Inc., said that a re-examination ought to take place once in three years. He asked whether the age of the employee influenced the length of time of re-examination.

Mr. Hyland said that for nineteen years the steam railroads had required re-examinations. It was highly important to have re-examinations of passenger motormen every three years and of freight motormen every five years.

J. P. Barnes, Syracuse Rapid Transit Company, asked what would be done if a motorman who had been in the service for some time, and had a good record without accidents, was found upon re-examination to be in unsatisfactory condition.

Mr. Hyland said that he would report such a case to the general manager.

President Choate said that some electric lines had had re-examinations more often than once in every three years.

C. N. Duffy, Milwaukee Electric Railway & Light Company, was then asked by President Choate to discuss the subject. He said that in the comparisons of the percentages of gross operating revenue expended for injuries and damages it was necessary, in order to be fair, to consider the different methods, conditions and problems existing in the various cities compared. He said that the subject of re-examination of employees was a very important one. The chief surgeon of The Milwaukee Electric Railway & Light Company was one of the most important men in the organization. He not only examined all men when they first entered the service of the company, but kept in touch

with them through the transportation department and in cases affecting claims or accidents. The chief surgeon was at the call of the company at all times.

Mr. Duffy said he thought the companies would find it absolutely necesary to set up a reserve fund for the payment of claims for injuries and damages. A company might have a serious accident involving so large an amount that it would not be eliminated from the accounts for five years. In such a case, each month's revenue should bear a proportionate part in the retirement of this expense.

Mr. Duffy then discussed the work of the American Electric Railway Association and the developments of the company section movement, in which he has been a leader. He said he hoped to see the day when, in addition to the present associations serving the different industries, there would be one general association representing all of the public utility companies to present an unbroken front on all questions affecting these properties. He spoke of the growth of the National Electric Light Association within the last few years as a result of the company sections. The problems affecting different classes of public utility companies were practically the same and there ought to be one national association to stand for all corporations of this nature. When the companies educated employees they would be able to educate the public.

J. C. Collins, of Rochester, said that it should be possible for the companies to educate the public to take up claims directly with the companies. He referred to a case in which a claimant gave most of the money secured to a lawyer.

Mr. Hyland said he thought the claim agent should be a man that would have the confidence of the public. These processes might work slowly, but if such a man should be employed it would be found after a few years that people who knew him in the community would go directly to him if they had claims against the company.

President Choate said he would like to suggest, following Mr. Peck's request, that the discussion as well as the papers be published in full in pamphlet form for distribution to the members. This suggestion was approved.

Mr. Choate said it had been suggested that in order to strengthen the membership of the association a committee should be appointed to draft a resolution providing for the admission of individuals as members of the association. This resolution should be so worded as to provide for the membership of employees.

Mr. Harvie offered a resolution providing for the appointment of a committee by the incoming president to draft the necessary resolution permitting the entrance of individuals as members into the association. He said that the committee should act so that the change in policy would become effective at the next quarterly meeting.

The report of the nominating committee, as follows, was then read by E. F. Peck:

President, W. H. Collins, general manager Fonda, Johnstown & Gloversville Railroad.

First vice-president, J. C. Calisch, vice-president Buffalo & Lake Erie Traction Company.

Second vice-president, Frank Hedley, vice-president and general manager Interborough Rapid Transit Company, New York.

Secretary, Charles C. Dietz, United Traction Company, Albany.

Treasurer, H. M. Beardsley, general manager Elmira Water, Light & Railroad Company.

Executive committee: J. Stanley Moore, general passenger agent Auburn & Syracuse Electric Railroad; Charles H. Smith, assistant general manager United Traction Company, Albany; James F. Hamilton, general manager Schenectady Railway; Stuart Wilder, general manager Peekskill Lighting & Railroad Company.

The secretary was instructed to cast one ballot and the nominees were declared elected.

Mr. Collins was then escorted to the chair and expressed deep appreciation of the honor. From his work with the association in the past he realized fully the responsibility that went with the office. He had been encouraged greatly by the successful meeting and asked the help of the members in order that the splendid achievements and standards of the past might be realized in the coming year.

The meeting was then adjourned.

MEETING OF THE COMMITTEE ON INSURANCE

The committee on insurance of the American Electric Railway Association held a meeting at the office of the association in New York on Friday, June 21. Those present were S. L. Tone, of Pittsburgh; E. W. Cook, of Rochester, and H. J. Davies, of Cleveland. H. N. Staats, the association's insurance expert, was also in attendance.

Later in the morning the committee held a joint meeting with the Central Traction & Lighting Bureau, which was represented by E. G. Richards, president; W. H. Sage, vice-president; C. G. Smith, secretary and treasurer, and William A. Stoney, acting secretary of the bureau; also by R. M. Bissell, vice-president Hartford Insurance Company; Louis Wiederholt, Jr., secretary insurance bureau of the middle department; Edward Milligan, vice-president Phœnix Insurance Company, of Hartford; E. H. A. Correa, vice-president Home Insurance Company; Edward Reese, secretary Aetna Insurance Company, of Hartford; Mr. Hoyt, New York manager London & Liverpool & Globe Insurance Company; Mr. Potter, manager Underwriters' Association of the State of New York, and R. F. Schoen, manager Southeastern Tariff Association, Atlanta, Ga.

At this joint meeting the members of the insurance committee of the association explained the purposes, plans and hopes of the committee, and the insurance men expressed a willingness to write the insurance of traction companies at reasonable rates and to furnish frequent inspection by expert inspectors. In conclusion a sub-committee was appointed, consisting of three members of the association's insurance committee and three members of the board, to determine what action could be taken for the mutual benefit of both interests. The members of this sub-committee who will represent the insurance committee are A. H. Ford, S. L. Tone and H. J. Davies.

The British Electric Traction Company, England, reports that the total traffic receipts for the year ended March 31, 1911, came to $8,853,740, showing an increase of $402,105 over 1910, a satisfactory development being that the receipts and the passengers carried per route mile have steadily increased—the receipts having gone up from $18,190 to $18,900 per route mile, and the passengers carried from 699,043 to 725,321 per route mile. The total number of passengers carried was 339,696,820, as compared with 324,796,450 in 1910. Substantial progress was also made in the electricity supply department, the number of units generated at the power stations showing an increase of nearly 10 per cent. The net profits of the associated companies were larger by $425,000, and while the amount applied to debenture interest and dividends shows a substantial increase, and the amounts placed to reserve are also larger, the British Electric Traction Company receives $175,300 more interest and dividends from associated companies. The directors propose to pay the dividend for the year on the 6 per cent cumulative preference stock, and in limiting the distribution to this stock they express the opinion that on the present occasion the best interests of the company will be served by strengthening its position and they therefore apply the increased profits to writing down certain items in the balance-sheet by $170,210, and also place $100,000 to reserve as was the case in the preceding year.

ROCHESTER MEETING OF THE JOINT COMMITTEE ON BLOCK SIGNALS

The joint committee of the Engineering and Transportation & Traffic Associations met at Rochester, N. Y., on June 14 and 15 and made good progress with the completion of the report which it will present at the Chicago convention. The members of the committee present were J. M. Waldron (chairman), Interborough Rapid Transit Company; C. H. Morrison, New York, New Haven & Hartford Railroad, and John Leisenring, Illinois Traction System. There were also present W. K. Howe, General Railway Signal Company; H. W. Griffin, Union Switch & Signal Company; A. D. Cloud, *The Signal Engineer,* and L. E. Gould, Electric Railway Journal.

SIGNAL ASPECTS

A general discussion was first held on the subject of signal aspects and indications. This discussion was a continuation of that held at the March meeting in Chicago, at which time it was agreed by the members of the committee and representatives of the signal manufacturers there present that conformity to the recommended standard practice of the Railway Signal Association in using three-position, upper-right-hand quadrant signals would be impracticable on account of interference with the trolley poles and trolley wire supports. The Rochester discussion, however, changed this viewpoint.

As a basis for discussion Mr. Morrison presented a number of sketches showing different signal aspects for different right-of-way and operating conditions. These included the following:

(a) Miniature dwarf blade mounted on a bracket mast and arranged to operate in the upper-right-hand quadrant.

(b) Bracket post signal, center-suspended and standard size, arranged to give upper-left-hand quadrant indications in three positions.

(c) Three-position upper-left-hand quadrant signal on a straight mast, the 90-deg. and 45-deg. positions of the blade being also indicated. The blade was shown as 20 ft. above the top of the rail and 3 ft. above the car clearance line.

(d) Dwarf signal on a bracket post, arranged for upper-left-hand quadrant, three-position indications.

(e) High signal, three-position, upper-right-hand quadrant (following Railway Signal Association practice), pivoted to a heavy bracket mast.

(f) High signal, three-position, upper-left-hand quadrant, on a bracket mast.

(g) Dwarf signal, two-position, upper-left-hand quadrant, clamped to a trolley pole (this was shown at the Chicago meeting).

(h) High signal, two-position, upper-left-hand quadrant, on a standard signal mast.

(j) Light signal.

(k) Dwarf signal, two-position, clamped to an iron trolley pole on a highway.

(l) Light signal attached to an iron trolley pole.

After a thorough discussion of these signal aspects, the committee expressed the opinion that three-position, upper-left-hand quadrant signals should be used by those electric roads which used semaphore signals provided a two-position installation was not already in satisfactory service. On some properties it would be found desirable to operate the three-position signals in the two positions only. The discussion on signal aspects included the recital of the observations and experiences of the committee members on the matter of appearances and visibility of signals when placed close to trolley poles and overhead structures.

The committee favored the upper-left-hand quadrant for all conditions of high-speed or low-speed interurban or other electric railway traffic where semaphore signals are used.

In the discussion on the relative merits of two-position and three-position signaling, Mr. Morrison said that high-speed interurban roads should have a caution signal of some kind. The two-arm mast and the home-and-distant separate signal scheme of providing a caution signal are alike impracticable, principally because they are too expensive for electric lines. The alternative is three-position signaling, which is practicable. In cases where sidings are 4 miles or 5 miles apart—so far apart that a motorman, with all he has to do between signals, is likely to forget a caution signal governing his actions with respect to the next signal ahead—only two positions need be used. The recommendation of the committee, therefore, should not restrict the use of two positions where it is expedient or desirable.

Mr. Griffin expressed the belief that the vertical blade, which three-position signaling would require, would not be easily distinguishable.

Mr. Morrison showed the necessity for a caution signal in several specific instances, as where it is desired to run a large number of cars in one direction for a time, as at a baseball or football game. Motormen require caution signals in such cases, for without them the cars could not "close up" safely. The same conditions are encountered in the handling of morning and evening crowds in districts where the necessity for caution indication is the greatest. The giving of such indications is the most practicable, since speeds are low and the vertical position of a three-position semaphore blade will be discernible at such a distance as not to interfere with operation.

Mr. Leisenring stated that if the blades are kept clean and bright signals indicating in three positions will be as easy to see as if indicating in two positions. He said also that roads now having two-position signals should be allowed to continue their use under the committee's recommendation.

Mr. Morrison suggested that upper-left-hand quadrant, two-position or three-position signaling should be covered in the recommendation

Conditions in which roads would be limited to the use of two-position signals were then discussed, such as long blocks between sidings, and ways of installing two-position signals so that they could later be converted to three positions were suggested.

Mr. Morrison thought steam road rules should apply to electric roads also. Having been drawn up by men of long experience in operation, the American Railway Association standards would undoubtedly fit electric railway conditions better than any others that could be framed. He pointed out that electric road employees shift about from one road to another much more than employees of steam lines, and that standardization of signals is, therefore, all the more necessary on electric roads. The tendency to electrify steam lines indicates the desirability of adopting the same standards for both steam and electric operation.

A discussion then followed on the practicability of recommending the three-position signal mechanism for all roads using semaphores. It was held that those roads which found it desirable to operate with two-position signaling could use the three-position mechanisms and thus always would be in a position to go to three-position signaling.

Mr. Howe stated that where two-position signaling was used with a three-position mechanism the proceed indication should be 90 deg.

Mr. Leisenring also said he did not believe the advantages of the 60-deg. indication sufficient to warrant the adoption of it against the 90-deg. indication. It was also pointed out that this would keep the indications in conformity with those in steam railway practice; that is, the horizontal position for stop, the 45-deg. position for caution and the 90-deg. position for proceed.

Mr. Morrison thought that a road now using the 60-deg. position for proceed should continue to use it and not have the confusion which would follow the use of both aspects.

LIGHT SIGNALS

Next came the discussion of the signaling for suburban roads and the consideration of the merits of light signals

and dwarf signals. Mr. Morrison suggested that where light signals were to be used the committee should recommend that they consist of three indications—red for stop, yellow for caution and green for proceed. Reference was made to the comparatively large number of electric railways which are soon to be operating under light signals, and reference also was made to the brief description of this practice as presented in the recent report of the block signal committee of the Illinois Electric Railway Association. With regard to the visibility of light signals in the daytime and to the possibility of phantom signals being shown at night owing to the reflection of electric headlights, the committee felt that more time should be had for observation before any definite recommendations should be made to the association.

Referring to the question of two-position and three-position signals, Mr. Griffin thought that there were cases where three-position signaling should not be used. Mr. Howe thought that a road should use the horizontal and 90-deg. indications and not horizontal and 45-deg., as if three-position signaling were later installed the caution position would be 45 deg. Mr. Morrison asked if the committee desired to recommend that the proceed indication be 90 deg. He said that if the committee could decide as to what the proceed indication was to be it could recommend the stop indication horizontal and the proceed indication 90 deg., and that would leave in three-position signals only the 45-deg. caution indication. If a road should want to use two-position signals and employ horizontal and 90-deg. indications and then to use three-position signaling, it would merely stop the signal at 45 deg. for caution. He desired to make the point that if the committee should recommend 90 deg. as proceed it should recommend 45 deg. for the caution signal.

On request of the chairman, Mr. Gould described in detail the experiments made with the light signals on the Michigan United Railway in February, 1911. These experiments were made to determine in so far as possible the distance at which light signals with 8-in. and 10-in. lenses could be read and would be considered as arrestive. The experimental signal set was built by the General Railway Signal Company, and the tests were carried out by the engineers of the electric railways.

ASPECTS WITH LIGHT SIGNALS

The committee then discussed the aspects that would be most desirable with light signals. Mr. Morrison told of having made certain tests on the Delaware, Lackawanna & Western Railroad in connection with red and yellow light signals, and in these tests under certain operating conditions the yellow lights were mistaken for red lights. Under certain other conditions, as pointed out by Mr. Howe, a red light had been mistaken for a yellow light. This led to the opinion expressed by several members of the committee that with light indications only some marker light should always be a part of the aspect so that there would be a standard available for comparing and quickly recognizing the red or yellow light. In other words, no attempt to do three-position signaling with light indications should be made unless a marker light was a part of the aspect.

Some of the signal engineers thought that the cost of three-position light signaling would very closely approximate the cost of three-position semaphores, both as to initial cost and as to the cost of operating and maintenance. It was suggested that the committee, for the present at least, report progress on light signals with an explanation as to why the members were unable to recommend final aspects. The committee instructed John Leisenring and C. D. Emmons to inspect the light signals being installed in Indiana so that they would be in a position to discuss this subject at the convention and so that they might report to the committee.

At 3 p. m. the committee adjourned to accept the hospitality of the General Railway Signal Company for a visit to its manufacturing plant and for a 60-mile automobile ride and a fish dinner.

SECOND DAY SESSION

The committee reconvened on Saturday and discussed the wording of the proposed recommendations as to indications. After several drafts had been prepared it was finally decided to consider for presentation in the report the use of the American Railway Association recommendations.

Other matters under discussion at this session were the proposed recommendation of semaphore signaling in the upper-left-hand quadrant as standard practice, and also the possibility of recommending three-position signaling and describing the aspects that should be adopted as standard, and the alternative aspect for two-position signaling and the possibility of presenting aspects for recommended light signaling.

TYPICAL SIGNALING PLANS

Following the discussion on the foregoing recommendations the instructions from the executive committee as to signaling for various conditions of speed, headway, etc., were taken up. These requirements for typical layouts as laid down by the executive committee included a variation of operating conditions from speeds on single-track roads of less than 20 m.p.h. and headways varying from five to thirty minutes to speeds of 40 to 60 m.p.h. on double-track roads, and on single-track roads with headway as frequent as 15 minutes.

Mr. Leisenring presented a number of schemes and these were discussed at considerable length. There being no information in the instructions as to the distances between sidings, an average distance of from 1½ to 2 miles was assumed in the typical layout that the committee plans to prepare for its fall report.

The committee thought it desirable to suggest that the signaling expenditure should be concentrated on track-circuit control, even though the form of indication had to be made much cheaper than at first seemed desirable. This is in preference to a more expensive form of signal and less reliable control.

The typical signaling layout for various electric railway conditions will be revised by Mr. Leisenring in accordance with the discussions at the Rochester meeting and later will be reviewed for inclusion in the report. Mr. Morrison will prepare drawings indicating the various signaling aspects under different roadway and overhead conditions. These drawings are to show the positions of the trolley pole, clearances and the signal aspects in the upper quadrant in the case of semaphores.

NEXT MEETING

The committee will hold another meeting at Buffalo, N. Y., in the latter part of July and review the additions to the material which has already been collected for its annual report.

DIFFERENCES BETWEEN NEW HAVEN A.C. AND A.C.-D.C. LOCOMOTIVES

The following data will be found of interest in amplification of the article on "Additional Twin-Motor Locomotives for the New Haven Railroad," which was published in the ELECTRIC RAILWAY JOURNAL for June 22, 1912:

The truck construction for all of the thirty-nine Baldwin-Westinghouse locomotives is exactly the same except that the third-rail shoe is omitted from the trucks for the three a.c. engines. The only differences between the straight a.c. and the a.c.-d.c. engines is in the motors; furthermore, the following items were omitted from the straight a.c. engines: (a) control resistors; (b) there is one switch group less; (c) compressor and blower; (d) steam heater plant; (e) third-rail shoe and overhead d.c. collectors; (f) changeover switches. The weight of the straight a.c. locomotives is 113 tons and that of the a.c.-d.c. locomotives 120 tons.

MEETING OF THE KEYSTONE RAILWAY CLUB

The second meeting of the Keystone Railway Club was held at the Hotel Columbus, Harrisburg, Pa., on June 25. This was the first regular business meeting of the club and there were present thirty-two electric railway men and forty-three representatives of manufacturers.

The meeting was called to order by President J. L. Gould, and after the minutes of the previous meeting had been read and approved, the report of the committee on constitution and by-laws was presented by E. C. Spring, chairman of the committee. In the consideration of the report J. G. Baukat, secretary of the club, stated that, in view of the existing temporary character of the organization, all of those present would be entitled to discuss and vote upon all questions coming before the meeting.

The constitution and by-laws as submitted by the committee were then discussed by sections and formally adopted as submitted, subject to certain amendments covering points which were brought out in the discussion. It was the sense of the meeting that the object of the club should be to promote knowledge on all matters relating to the construction and management of electric railways, to collect and disseminate information of value to electric railway interests, to promote the interchange of traffic, to encourage social relations among members, and in general to advance the interests of electric railways. The membership of the club is to be confined to the states of Pennsylvania, New Jersey, Delaware and Maryland, although by a two-thirds vote of all members present at any meeting additional territory may be included. The membership is to consist of those connected with the construction, operation and maintenance of electric railways or of their equipment, and is to include civil, mechanical and electrical engineers and students in engineering colleges. A paid secretary is to be appointed by the executive committee, whose duties shall include services deemed by it to be effective in promoting the interests of the electric railways of the territory covered by the club. The present secretary, J. G. Baukat, stated, however, that he was serving the term to which he was elected without remuneration. Regular meetings of the club are to be held on the fourth Tuesday of each January, March, May and September, at such places as are designated by the executive committee, and so far as practicable alternating between states in the scope of the club territory.

After the adoption of the constitution and by-laws the meeting proceeded to the consideration of unfinished business, unanimously electing as the second vice-president H. J. Crowley, general manager American Railways Company, and as members of the executive committee R. P. Stevens, president Lehigh Valley Transit Company; R. E. Danforth, general manager Elizabeth and Trenton Railroad Company; W. A. Heindle, manager Wilmington & Philadelphia Traction Company, and Thomas Cooper, Westinghouse Electric & Manufacturing Company. The executive committee will also include as ex officio members President Gould and Vice-presidents Wheaton and Crowley.

For the next meeting of the club, which will be held next September at a place to be later decided by the executive committee, President Gould appointed an entertainment committee composed of O. R. Kerschner (chairman), C. M. Paxton, E. J. Smith, J. V. E. Titus and W. E. Harrington. As a committee on subjects for technical discussion President Gould appointed H. Bransom (chairman), S. S. Crane, H. R. Stadleman, G. R. Lyman and Nathan Shute.

PAPERS AND DISCUSSIONS

A paper upon "The Relationship of the Equipment Department to the Traffic Department" was then read by C. M. Paxton, assistant general manager American Railways Company. Mr. Paxton spoke of the necessity for fostering traffic on every property not so unfortunately situated as to be incapable of growth. To do this he believed it necessary to expend upon the service all that the traffic could possibly bear, or, in other words, all for which it could possibly be made to provide. A certain volume of traffic comes of necessity and is assured regardless of any lack of effort on the part of a railway, but if the company should persist in a policy based upon taking care of this traffic indifferently it is certain that additional traffic will be discouraged and that other and more serious complications will be encountered in time. Mr. Paxton stated his belief that much trouble and litigation could have been avoided at least for some railway companies by the adoption of a more liberal policy in anticipating and providing for traffic needs before being forced to do so. He placed a large share of responsibility upon the equipment department, saying that the days of the horse car with straw on the floor for a foot warmer had passed and instead there existed a traffic which demanded clean, safe, comfortable and presentable cars. Failure to provide them would in the end result disastrously to the railway. He called attention to the foolish or criminal acts of men or women as a collective body, whether evidenced in panics, lynching parties or political conventions, stating that the electric railways encountered the same phenomenon, and that in consequence an appeal to the individual as distinguished from the mass was the only means of obtaining fair and reasonable consideration. As the car is the one thing with which the individual comes most in contact and which affects his personal comfort, its condition should be made a matter of primary importance. If car failures are eliminated, annoying transfers avoided and schedules maintained, many shortcomings on the part of a railway will be overlooked and fewer burdens will be placed upon it.

The second paper presented before the meeting was on the subject of shop management and was prepared by Henry Branson, formerly superintendent of equipment Philadelphia Rapid Transit Company. Mr. Branson spoke of the advantages that accrue from co-operation between the shop management and the employees, by ridding the shop of petty jealousies and talebearing, by getting the ideas of the men, giving proper credit for such as are turned to practical use, and by educational talks with every man in the shop. A strong argument was made in favor of record systems and the establishment of piece work in electric railway shops. Attention was, however, called to the absolute necessity for dealing fairly with the workmen, not only to promote a healthy condition in the shop, but in order to obtain the best class of workmen, capable of maintaining the high rate of production which is just as essential in repair shops as in manufacturing organizations.

In the discussion following the reading of the paper, E. C. Spring expressed a doubt whether piece work could be successfully applied in shops of small size. Mr. Branson stated in answer that it was possible in any size of shop, but that improved methods of payment were more easily introduced in large organizations. W. E. Harrington recounted his experience with piece work on a road having 100 cars and stated his complete satisfaction with the system. W. H. Wheaton called attention to the difficulty of setting prices with equipment which covered many different types of cars, trucks and motors and said that he had tried piece work under such conditions but had become dissatisfied with the results. He also pointed out the impossibility of putting all repair jobs on a piece work basis. Captain W. B. Rockwell discussed the subject with reference to railways having a large mileage but comparatively few cars. He did not believe it practicable under such conditions. J. G. Baukat stated that although he had been against piece work originally his experiences with it in the shops of a large steam railroad had caused him to change his opinion. He agreed that each shop offered an individual problem and that no set of universal piece prices could apply. Notwithstanding this he had effected

large economies by the piece-work system and was strongly in favor of it.

W. H. Wheaton, master mechanic of the Wilkes-Barre Railway Company, presented the third paper, which was on the subject of the preparation of equipment for summer business. He recounted experiences in changing over equipment to open car bodies, giving valuable hints as to time-saving methods which could be employed. Mr. Wheaton recommended placing car bodies in such a position, when they are laid up in the fall, that the cars shall be available in the order in which they are needed in the spring, and that repairs should be made when the cars are laid up. Mr. Wheaton advised keeping accurate records of car bodies and assigning equipment to bodies, both open and closed, of as nearly the same weight as possible. Attention was called to the necessity for keeping running boards in first-class condition.

A lunch for the members at the meeting was served in the café of the Hotel Columbus, and later in the afternoon special cars were provided by F. B. Musser, president of the Central Pennsylvania Traction Company, for a trip to the carhouse and power station of the Harrisburg lines.

EMPLOYEES' BULLETIN IN PHILADELPHIA

Employees' Bulletn No. 5 has been issued by the Stotesbury management of the Philadelphia Rapid Transit Company under date of June 24, 1912. It discusses the subjects of safeguarding children, improved service and increased wages. The bulletin says in part:

"The summer vacation of the school children commenced June 15 and continues to Sept. 9. During this vacation period last year 137 children under fourteen years of age were struck by our cars and more or less seriously injured.

"The co-operation of the Board of Public Education of the city of Philadelphia has been enlisted in the giving of warnings to school children. Martin G. Brumbaugh, superintendent of schools, and his able assistants and teachers have cautioned the school children, making their talks particularly forcible by the aid of graphic pictures supplied by this company and displayed on the blackboards of the various school buildings.

"Through the courtesy of the Board of Public Education of Philadelphia and the Archdiocesan School Board of Philadelphia, this company has just completed the distribution to the parents of the school children of 250,000 copies of a booklet containing cautionary matter. This booklet has been indorsed by the permanent public safety committee and contains photographs showing the dangers to children.

"During May, 1912, twenty-three children under the age of ten years came into collision with the cars of this company, and all except one were saved by the safety fender or wheelguard with but slight injury. These children struck by cars were, generally speaking, not attending public schools, and in order to reach such children most effectively Mayor Blankenburg and the director of the Department of Public Safety, George D. Porter, have issued instructions to the lieutenants of police at the various police stations to see that the children are prevented from playing on streets occupied by car tracks.

"All motormen will now be required to exercise the greatest care and caution in their effort to avoid accidents, and the speed of cars must be reduced at points of danger sufficiently to insure against the possibility of injury to children.

IMPROVED SERVICE AND INCREASED WAGES

"The two important things to be accomplished, to which this management and its motormen and conductors must now exert their utmost efforts, are:

"1. Adequate service to the public.

"2. Increased wages to motormen and conductors.

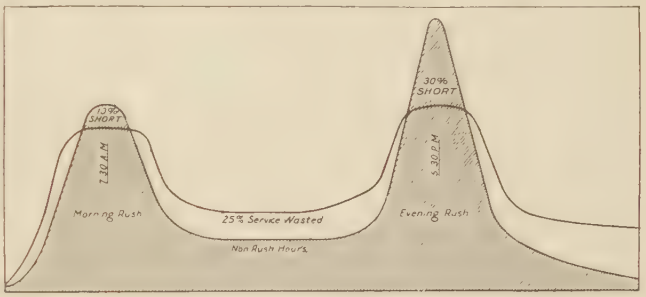
"There should be the greatest degree of co-operation in these efforts, a careful investigation having demonstrated that the car schedules are possible of rearrangement in such a way as not only to supply the additional car service necessary during the rush hours but at the same time to make possible a considerably increased wage to the motormen and conductors.

"The secret of successful street railway management consists very largely in the close adjustment of car service to the needs of the public.

"The present condition in this city, so far as relates to car service to the public, is very similar to that which prevailed in Chicago prior to the year 1905. Briefly stated, too many cars are in service during the light hours of travel, and entirely too few cars are operated during the rush hours, when people are going to and from their work.

"As showing that which it is possible to accomplish in the way of increased wages by a rearrangement of schedules to fit the traffic properly, the Chicago City Railway, under the direction of Chairman Mitten, increased the maximum wage paid to motormen and conductors from 24 cents per hour in 1905 to 30 cents per hour in 1911, and this without at any time increasing the percentage of gross passenger earnings used for the purpose.

"The car schedules were rearranged so as to fit closely the needs of the Chicago public, and this was done by a most effective timetable department, under the direction of Leon Jewell. The result secured by Mr. Jewell in the matter of dividing the car schedules into runs acceptable



Graphic Chart Showing Traffic Conditions in Philadelphia

to the men was so satisfactory that he has now been retained by the Philadelphia Rapid Transit Company and has been engaged here for several months past in the preparation of new car schedules for the Philadelphia system.

"As an example of traffic conditions in Philadelphia a graphic chart has been prepared and is reproduced herewith.

"The maximum number of passengers carried is represented upon the chart by the shaded area inclosed by the black line. The full line represents car capacity as now operated and shows that during the morning rush period the cars operated are 10 per cent short of the required capacity; during the evening rush period the cars operated are 30 per cent short of the required capacity; during the non-rush hours of the day 25 per cent more cars are operated than are required to supply seats to all passengers. It is thus made clearly evident that there is a great shortage of cars during the morning and evening rush-hour periods and an over-supply of cars during the hours of lighter traffic.

"The car capacity which will be supplied under the revised schedules will closely follow the line indicating passengers carried, thereby saving the waste during the non-rush hours and providing adequate service to the pubic during the morning and evening rush. These necessary changes will be made effective as rapidly as the new cars now being received make possible.

"This adjustment of car schedules will result in providing adequate service to the public, and because of the saving in waste due to the withdrawal of unnecessary service during the hours of lighter traffic, together with the advantage

gained by the added capacity of the 800 new 'near-side' cars now being received, will add materially to the 22 per cent fund, thus serving to make possible further increase in wages.

"Twenty-two per cent of this company's gross passenger earnings has, commencing July 1, 1911, been set aside in a separate fund, from which all payments to motormen and conductors are being made. The maximum wage paid prior to July 1, 1911, was 23 cents per hour. This was increased to 23½ cents per hour commencing July 1, 1911, and upon Jan. 1, 1912, to 24 cents per hour. It is now proposed to increase the maximum wage 1 cent per hour effective July 1, 1912. The new maximum rate thus established will then be 25 cents per hour, or an increase of 2 cents per hour since June 30, 1911, all of which has been accomplished by the aid of the 22 per cent fund. The amount remaining unexpended in the 22 per cent fund as of April 30, 1912, amounted to $11,169, and this amount it is estimated will be increased so that at the close of the fiscal year, on June 30, 1912, it will be something in excess of $30,000.

"With the earnest co-operation of the motormen and conductors, this change in car schedules, when put in full force and effect at each of the nineteen depots, will make possible such further increases as will advance the wage from the present maximum of 24 cents per hour to a maximum wage of 28 cents per hour during the year commencing July 1, 1913."

NOTICE TO EMPLOYEES

On June 25 the company posted the following notice:

"The settlement of the strike in 1910 was conditioned upon the company paying a graded scale by which motormen and conductors in its employ Jan. 1, 1910, were to receive 23 cents an hour July 1, 1910, with an increase of ½ cent an hour upon each July 1 thereafter, thus reaching a maximum rate of 25 cents an hour July 1, 1914.

"The co-operative plan was put into effect and the 22 per cent fund established by the Stotesbury management on July 1, 1911, the result being that in the short space of one year, or beginning July 1, 1912, all of the aforementioned motormen and conductors will receive this maximum rate of 25 cents per hour, a full two years in advance of the time promised as a result of the 1910 strike.

"The co-operative plan with the 22 per cent fund has therefore already proved of greater effect in producing increased wages than did the strike of 1910. Notwithstanding this fact, however, certain of the motormen and conductors, being misled by C. O. Pratt, are persistently misleading and harassing their fellow-motormen and conductors and combining to destroy the effect of co-operative effort.

"All motormen and conductors are expected to co-operate with the management in adjusting the service to the needs of the public as set forth in Employees' Bulletin No. 5, of June 24, and those who persist in attempting to destroy the effect of co-operation between the men and the management will in future be considered as trouble makers, and for that reason dismissed for the good of the service."

The order is signed by L. A. McCoubrie, superintendent of the elevated lines, and M. F. Ryan, superintendent of surface lines, and approved by James Bricker, superintendent of transportation.

In an editorial "Trouble Makers Must Go," in its issue of June 27, 1912, the Philadelphia *Public Ledger* said in part:

"The public is deeply concerned that the general program of the company shall not be unnecessarily interrupted. The employees had a fair opportunity to work under a formal contract between the company and a trades union, but by their own dissensions they have made that impossible. Nevertheless, the company has carried out its original policy, under which the car earnings have been so increased that the schedule for wage advances has been anticipated by a year. Self-interest, if nothing else, would seem to dictate to the carmen a policy of co-operation and efficiency, for they must see that they will be the first to suffer from a return to the old condition of mutual distrust and antagonism. At present the only obstacle in the way of a fair opportunity for company and riding public seems to be the activity of professional mischief makers."

OPENING OF A. I. E. E. CONVENTION

The twenty-ninth annual convention of the American Institute of Electrical Engineers opened at the Hotel Somerset in Boston, Mass, on Monday, June 24. The opening reception was held on Monday evening, and this was followed by a dance. On Tuesday morning the convention was formally called to order by President Dunn, about 500 members and guests being present. The president's address dealt with the status of the engineering profession and traced the growth of engineering methods and modes of thought from the time of the early philosophers.

At the close of the president's address, President-elect Ralph D. Mershon was presented to the convention, in accordance with the usual custom of the Institute.

In the regular business sessions which followed H. W. Buck presided over the electrochemical session and President Dunn over the high-tension transmission session. On Wednesday morning there was held a joint meeting with the Illuminating Engineering Society, and in the afternoon the railway session took place. The latter meeting was characterized by a spirited discussion of Samuel Insull's paper on the relation of the central station to railway electrification. On Wednesday evening a general meeting of Institute officers and section delegates was held in order to consider co-operation with other societies, preparation of papers and other matters pertaining to the welfare of the Institute.

Many entertainment features were provided for the ladies who were guests of the Institute, trips to different points of interest being arranged for each day of the convention. A concert was given on Tuesday evening and a theater party on Wednesday evening, the official Institute banquet being held on Thursday evening.

COMMUNICATION

THE BROOKLYN CENTER-ENTRANCE CAR

Prepayment Car Sales Company
Montreal, June 25, 1912.

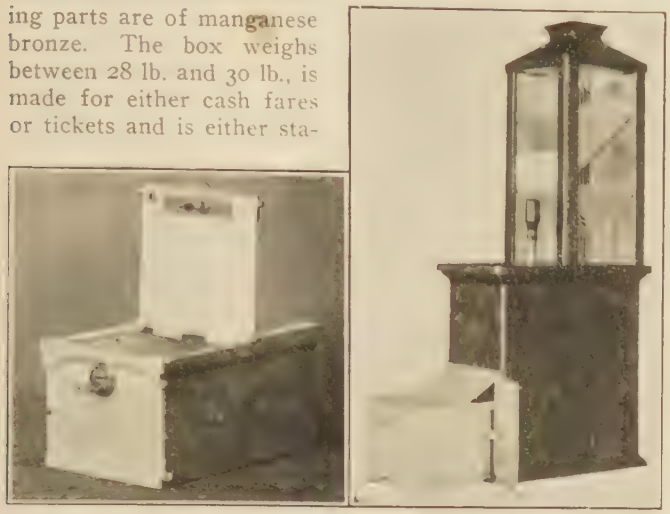
To the Editors:

I think that one statement in the editorial which you published on page 1064 of your issue of last week on the Brooklyn center-entrance car might be open to misconstruction by one who is not conversant with the patent situation covering car design. I refer to the statement that the devices on this car which were originated by the engineers of the company have not been patented and that the company welcomes their adoption by any other electric railway which desires to use them. The car possesses a number of novel features which were originated by the engineers of the company, and to these devices such a paragraph would apply. As described in your issue, however, it also includes a number of patented devices and arrangements which, of course, are not open to general use, except under arrangement with the owners of the patents. This distinction should be drawn, of course, by anyone who might wish to duplicate the car in its entirety. Thus we consider that certain features of the prepayment and entrance system used on the car are covered by patents owned by this company.

Duncan McDonald, President.

A NEW NON-REGISTERING FARE BOX

A new type of non-registering fare box has been designed by W. T. Cook and put on the market by the Cleveland Fare Box Company, Cleveland, Ohio. This fare box follows the usual outlines, but it embodies an original style of locking mechanism combined with light yet durable construction. The cabinet, cash box and doors are of ⅛-in. cast aluminum and all working parts are of manganese bronze. The box weighs between 28 lb. and 30 lb., is made for either cash fares or tickets and is either stationary or portable. If stationary it is screwed or bolted to a small stand which supports it at its proper location on the platform, and if portable a special form of clasp to which a padlock may be applied is employed.



Cash Box Showing Bolt Lock Inside of Box and Lugs on Lid—Inspection Chamber Baffles, and Cash Box Lid Openings as Inserted in Cabinet

One of the construction features of the cabinet is found in the design of the corner posts which support the glass surrounding the inspection chamber. These corner posts are of cast aluminum with 3/16 in. cold rolled-steel tie rods, which hold the top casting to the lid of the fare box, applied on the inside of the corner-post angle. The tie rods screw into the top casting and are attached to the cover with jam nuts on the under side. Novel features of the inspection chamber include saw-toothed baffles, which allow a space of 2 in. between the edge of the baffle and the glass sides for tickets and a space of 1 in. for cash. Three baffles are used in the ticket fare boxes and two baffles in the cash fare boxes. The saw-tooth design of these baffles makes it practically impossible to remove cash or tickets from the inspection chamber.

The trap door in the floor of the inspection chamber has a locking mechanism which makes it impossible to drop the receipts in the cash-box chamber unless the cash box is in position to receive it. The trap door is operated by a lever placed in the usual position beside the inspection chamber, while the locking mechanism is operated by having the lid of the cash box disengage a dog which holds the trap door in the closed position.

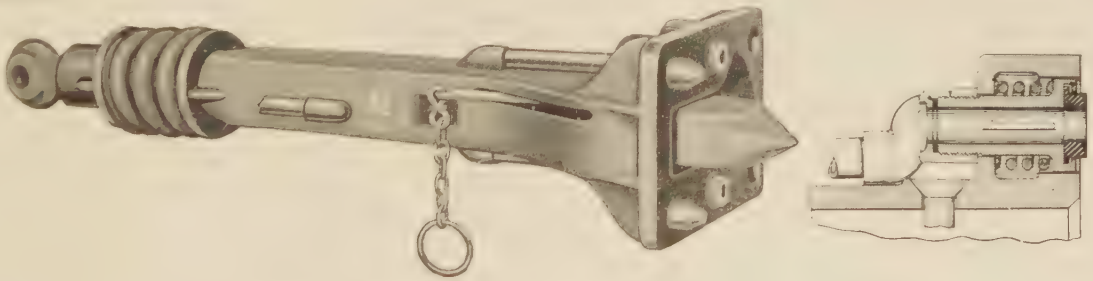
All bolts, nuts, screws and rivets are inserted from the inside of the cabinet, thus making it impossible to take the box apart without destroying it or unlocking the cabinet door and removing the cash box. The spout and cabinet cover are cast in one piece and bolt to lugs in the side of the cabinet, so that the whole construction is very strong. The door to the cabinet is provided with a Yale or Corbin lock and is swung from a pin. By casting a lug on the inside of the door on the hinged side and extending it over the opening, the door cannot be opened even though the hinge pin has been removed.

By far the most striking feature is the cash box. It cannot be inserted in the cabinet until it has been unlocked, and it cannot be removed without locking itself. The bottom and sides of the cash box have been cast in one piece and the top, to which the lid is attached by a pin hinge, is riveted to the lower portion of the box from the inside. The lid to the cash box has a spring lock which, when assuming the locked position, operates a second set of levers in order to bolt the cash box to the sides of the cabinet. This special lock is manufactured for the fare box company by both Yale & Towne and the Corbin Lock Company. Guide grooves are cast in the sides of the cabinet and lugs are furnished at the lock end of the cash-box lid, so that the lid is opened when the cash box is inserted. Upon passing these lugs through a ratchet wheel provided with dogs they are forced back through another groove cast in the sides of the cabinet, whereby the cash box is automatically locked as it is withdrawn.

This box was designed with the intention of keeping the key to the cash box in the cashier's office and the key to the cabinet in the hands of the carhouse man who is delegated to remove the cash boxes from the cars. A small lock stop has been provided to keep the lid to the cash box unlocked from the time it leaves the cashier until it is inserted in the cabinet. This lock stop is permanently attached to each cash box by a chain. Just before the box is inserted in the cabinet the lock stop is removed and dropped on the inside of the box. The cash boxes can all be numbered and the number can be exposed to view through an opening in the side of the cabinet.

AN AUTOMATIC AIR-CONNECTING CAR COUPLER

The Ohio Brass Company is listing an air-connecting coupler covered by the Tomlinson patents. It is designed for use in city and light interurban service where it is desired to connect up the air line of a train by the same operation that couples the cars. Its use saves time and reduces the danger in coupling or uncoupling cars as the car coupling and air connection are made or broken automatically and simultaneously without it being necessary for a man to go between the cars.



Tomlinson Automatic Coupler and Detail of Air Connection

The automatic air connection is made through two rubber gaskets projecting slightly from the face and held in air-tight contact by coil springs, as shown in the small cut. An important feature in connection with these gaskets is their position with respect to the rest of the coupler as it affects their wearing qualities and therefore the

efficiency of the coupler. They are set in the flat face of the coupler and operate in a direction parallel to its axis. Furthermore, the coupler hooks and the guide pins bring the gaskets into perfect alignment before they come in contact so that there is absolutely no possibility for a shearing or abrasive action on the rubber.

To uncouple the cars it is only necessary to pull the unlocking chain on one coupler and after the couplers have separated the coupler hooks automatically resume the coupling position ready for immediate recoupling.

The arrangement gives a positive mechanical coupling between cars and a non-leakable automatic connection in the air line. In fact, the train can be run over the most severe curves or breaks in grade without causing any opening between the coupler faces or loss of air.

BELVIDERE CITY RAILWAY COMPANY'S NEW CARS

The Belvidere City Railway Company, one of the subsidiary properties of the Elgin & Belvidere Electric Company, Marengo, Ill., recently put two cars in operation at Belvidere, Ill., which are novel in that a 16-ft. car body has been provided with practically all the facilities known to modern car construction. The cars were designed to be handled by one man, but instead of conforming to the near-side car design a 5-ft. 6-in. vestibule has been provided at each end with pipe railing to accommodate a fare box and arranged to allow passengers to enter through the front folding door, which opens in, and to pass by the motorman into the car. Passengers leave the car through the same vestibule, but through the exit folding door, which opens out. The doors at the front and back vestibule are opened and closed independently by operating handles convenient to the motorman. The door-operating levers also raise and lower the steps. In addition to the folding doors at the diagonally opposite corners of the car a single sliding door, which may be opened by hand, has been installed on the sides opposite the folding doors to permit exit at the rear of the car if required. The steps at the two sliding doors are not operated with the door, but are hooked up so that egress may be had there at the discretion of the motorman.

New Car for Belvidere, Ill.

The general dimensions of the car are as follows: Length of car body over corner posts, 16 ft.; length of car body over bumpers, 28 ft.; width of car at sill, 6 ft. 3 in.; width of car body over the post at the belt rail, 7 ft. 6 in., and length of the vestibule inside, 5 ft. 6 in. The car framing is of wood with ½-in. x 7-in. steel plates applied to the outside of the side sills. The segmental type roof is also of wooden construction and is equipped with mushroom type ventilators. The longitudinal seats, upholstered with rattan, extend along each side of the car body. A removable section in the center of one of these seats provides space for the car heater. The cars were designed and built by the St. Louis Car Company and are mounted on St. Louis standard No. 72 single trucks with an 8-ft. wheelbase.

NEW HAVEN CENTER-CAB-CONTROL SWITCHING LOCOMOTIVE

Included in the wholesale installation of electric switcher locomotives being made by the New York, New Haven & Hartford Railroad for its Harlem yard service is a locomotive somewhat different from the fifteen other switchers in that it is arranged for center-cab control. The radical difference lies in the fact that this locomotive has but one operating and controlling equipment, which is mounted in the center of the cab. Thus the engineer has but one location in the cab for operation in either direction, the same as he would have in running a steam switcher. The master controller is suspended from the roof.

New Haven Switching Locomotive

The locomotive was equipped in this manner in order to determine which was the better arrangement for shunting service, a double-end control (duplicate operating and controlling equipments at each end of the cab) or a center-cab control (a simple operating and controlling equipment mounted in the center of the cab).

The superstructure is of the "steeple type" with the control cab in the center and two sloping-end hoods protecting the switch group and auxiliary apparatus. Articulated trucks with four 192-hp single-phase Westinghouse motors are used, the motors being spring-supported above each pair of wheels. Power is transmitted through a gear on a grill which surrounds the driving axle and is carried in bearings at the bottom of the motor frame. The mechanical construction of the locomotive is, in fact, similar to the switchers described in the Electric Railway Journal of Feb. 17, 1912. Completely equipped the locomotive weighs 154,700 lb., and it is capable of exerting a tractive effort of 40,000 lb. up to 6 m.p.h. when taking single-phase current at 11,000 volts from the overhead line.

TRAILER CARS PROBABLE FOR LONDON

On June 11 a committee of the House of Commons unanimously passed a bill which gives to the London County Council Tramways the right to operate trailers subject to the conditions that the Board of Trade should approve all brakes, that no trailer should be run without the Board's approval, that the Board should sanction the route and times of running and that it might sanction a train consisting either of a motor car and a trailer or of two motor cars.

News of Electric Railways

Progress in Toledo

W. W. Miller, of Hornblower, Miller & Potter, New York, N. Y., who as attorney for the bondholders of the Toledo Railways & Light Company, New York, N. Y., was instructed by the sub-committee of the committees of the bondholders and stockholders of the company to prepare alternate reorganization plans, submitted these plans at a meeting of this sub-committee on June 19. The alternative plans are along the lines of those submitted by the bondholders' committee some months ago. The equity of stockholders will be preserved, but they will be required to subscribe to new securities to be issued in the reorganization. The original plan submitted by the bondholders proposed a holding company and three subsidiaries and provided for the sale of $5,000,000 of first-mortgage bonds and of preferred stock to produce funds to pay off $6,000,000 of first mortgage bonds of the present company. An assessment of $7 per share on the stock of the Toledo Railways & Light Company was proposed. Holders of the 4 per cent consolidated bonds were to receive stock of the new company. Neither reorganization plan was accepted by the stockholders' protective committee at a meeting in Toledo on June 27.

The reorganization committee desires to raise about $8,000,000 by the sale of bonds and stock. If neither of the reorganization plans which are now submitted is approved, it is said that the bondholders will proceed with their own plan of reorganization without reference to the stockholders.

On June 19, 1912, a committee representing the union employees visited President Frank R. Coates of the company and presented a written request for an increase in wages and a readjustment of the working hours. The wage scale which is asked is 28 cents an hour for the first year and 30 cents an hour for the second year and thereafter. The employees also ask that the schedules be so arranged that all runs shall be divided as equally as possible between two crews and that no day's work shall exceed ten hours, to be completed in twelve consecutive hours.

The question of rate of fare was not discussed at the meeting of the Council on June 17. The members did not feel disposed to inquire into the subject and an adjournment was taken.

Proposed Terminal Changes at Toronto Approved

The plans of the Toronto & York Radial Railway, Toronto, Ont., to deviate its Metropolitan branch from Yonge Street to a private right-of-way from Farnham Avenue to its proposed new terminal have been approved by the Ontario Railway & Municipal Board. It is proposed to have the road turn westward from Yonge Street at Farnham Avenue to a private double-tracked line crossing Woodlawn and Walker Avenues with two tracks and Alcern Avenue with a number of tracks. The terminal will have passenger platforms and freight sheds and will be situated between Alcern and Birch Avenues. A single track will cross the latter street and run to the railway viaduct to be used jointly by the Canadian Northern Railway and the Canadian Pacific Railway.

The Ontario Railway & Municipal Board says that on Oct. 25, 1911, it decided that the company had a right to deviate its lines to a private right-of-way. As to the contention of the city of Toronto that by using its own right-of-way the company was endeavoring to turn a terminable franchise into a perpetual right the commission says: "In any event such a suspicion would be no reason why this board, by the indirect method of imposing impossible or unreasonable conditions, should prevent the company from exercising its clear statutory right to deviate to its private right-of-way."

The commission points out that no appeal has been made from the decision of Oct. 25. The board's engineer reported that overhead crossings on the new Metropolitan line would cost more than $500,000. Since the company's net earnings are only about $29,000 a year, the proposed scheme of grade separation cannot be carried out. The board considers that the city's plans, which would force the railway to remain on Yonge Street south of Farnham Avenue, would increase the dangers to traffic on the former thoroughfare because a subway is to be opened under the railway viaduct. For the protection of the public the board will require the company not to run its cars faster than 6 m.p.h. from Farnham Avenue to its terminal and to stop at certain streets. It promises, moreover, to settle definitely, with the assistance of its engineer, the whole question of protection before the company commences operation of the deviated line.

The Board of Control of Toronto has decided to appeal from the above decision and Corporation Counsel Drayton has been instructed to apply for an injunction if necessary to restrain the company from proceeding with the work.

Milwaukee Electric Railway & Light Company's Tax Burden

The total amount of taxes due and payable Dec. 1, 1912, by the electric railway and electric light and power companies in Wisconsin on an assessed valuation of $46,365,000 is $525,128. Of this amount the assessment against The Milwaukee Electric Railway & Light Company, covering only the company's electric railway and electric light and power system in Milwaukee, is $296,572 on a valuation of $26,750,000. This tax is 56.4 per cent of the total of all the electric railways and electric lighting and power systems of Wisconsin. The assessment for the taxes for the year 1912, as made by the Wisconsin State Tax Commission, is based on the assessed value of the property owned and operated as of June 30, 1911. It will take 22 per cent of the net income of the company for the calendar year ended Dec. 31, 1911, as reported by the company to the Railroad Commission of Wisconsin, to pay the company's taxes of $296,572 for 1912. If the taxes of the company were assessed according to the Wisconsin income tax instead of on the ad valorem basis, the company's taxes for the year 1912 would be $59,977 instead of $296,572, which would mean to the company a saving of $236,595. In addition the company has burdens in the nature of taxes, such as paving between tracks, sprinkling tracks, removal of snow from tracks, etc., which increase the annual taxes approximately $100,000, making the total taxes more than $400,000 per annum, or about $1,100 per day for each of the 365 days in the year.

Freight Car Tax Ordinance Passed in Detroit.

At the regular meeting of the Common Council at Detroit, Mich., on June 11, 1912, an ordinance was passed to impose a tax of $3 per round trip on all freight and express cars operated within the city limits by the Detroit United Railway. The question came up on a divided report of the committee appointed to investigate the matter. The minority report, which was defeated, recommended that nothing should be done until the accountants going over the books of the company to secure data on the net earnings from this business had rendered their report. The majority report, which recommended the tax, was then adopted. The ordinance goes into effect at once. The argument was advanced that the adoption of the report would cause the accountants to hurry their work, whereas the tax could be amended if it was found to be too high when the conclusions of the accountants had been received.

Extension of Time on New York Brake Order

The Public Service Commission for the First District of New York has adopted an order, after rehearing, which provides for an extension of time in which to comply with a former order of the commission requiring the equipment of surface cars with power brakes. Commissioner John E. Eustis presented an opinion to the commission in part as follows:

"These tests, which were under the supervision of George L. Fowler, an expert employed by the companies, occupied

several months. Hand brakes of several types and also power brakes were tested on cars of different weights, at different speeds and under different rail conditions. Mr. Fowler made a tabulation of his test records which was introduced in evidence, and he testified that in his opinion, based upon these tests, geared hand brakes of an improved type were superior to power brakes on cars of the weights tested. . . . Seeing that it has been and is the constant endeavor in all railroad transportation to eliminate the 'human element' and so far as possible to substitute positive automatic devices, to approve the use of hand brakes instead of power brakes would certainly be reactionary. As was shown on the original bearing, power brakes are now in general use, both in this country and abroad, and it should require strong evidence to prove that this substitution of power brakes for hand brakes had been ill-advised or ill-considered and was not based on intelligent experience."

Cases of New York Commuters Summed Up

After eighteen months of contest between the commuters of Westchester County and the New York, New Haven & Hartford Railroad over the increase in commutation rates between points in the county and New York City, the case was summed up by counsel before the Public Service Commission, Second District, recently. Joseph S. Wood, for the commuters, declared that the changes in fare made July 1, 1910, increasing rates from 9 per cent to 80 per cent on various classes of traffic, had decreased the railroad revenue, added to the burden on travelers and decreased the value of real estate along the road. He showed by the records of the company that the number of passengers had decreased 609,387, or 11½ per cent, from 1910, when the rates were raised, to 1911, one year later, and that the company's revenue in 1911 was $31.000 less than the year previous, a falling off of 2.8 per cent, notwithstanding an annual average increase in population of 9 per cent. The increase in population in Westchester County from 1900 to 1910 was 56 per cent. Mr. Wood claimed that the value of property had depreciated 10 per cent since the rates were raised.

He pointed out that the higher fares cost the travelers $225,000 annually and imposed a loss of $136,000 on the road in suburban traffic. In thirty-one years, from 1879 to 1910, he stated passenger fares on this system showed increases from 60 per cent to 150 per cent, while freight rates were lowered from 4.3 cents to 1.3 cents per ton mile. Such freight charges resulted in an extraordinary increase in business. If the company reduced its passenger rates a like increase in income would inevitably result. He said he would be satisfied with a reduction of single-trip fares to those effective prior to July 1, 1910, but believed family and commutation rates should be lower than those charged before the increases of that year.

Benjamin Spock, for the company, defended the increases made by it and questioned the accuracy of many of the figures given by Mr. Wood.

The summing up on the complaints of the commuters of Westchester County on the increase in rates by the New York Central & Hudson River Railroad between points in Westchester County and New York City was heard recently by the Public Service Commission, Second District. Hearings have been held extending over more than a year. Coleridge A. Hart, for Peekskill, and Max Cohen, assistant corporation counsel, for Yonkers commuters, argued that the increases made in 1910 were unjustified, that they had injured the development of these localities, had been a hardship to the commuters, and that the company had failed to justify the increase.

Joseph S. Wood, for the Mayor of Mount Vernon, and C. C. Paulding, for the New York Central, will sum up on Monday, July 1.

Plans for Denver & Rio Grande Electrification Reported.—Benjamin F. Bush, president of the Denver & Rio Grande Railroad, Denver, Col., is reported to have announced that investigations are being made by engineers to determine the feasibility of electrifying the lines of that system over the mountain passes.

Plan for Direct Corporation Income Tax in New Hampshire.—Favorable action on an amendment allowing the Legislature to impose a direct tax on the incomes of public service corporations was taken on June 21, 1912, by the State Constitutional Convention in New Hampshire. The matter will be submitted to the voters at the next general election.

Trade Extension Trip by Trolley.—The first trade extension trip to be made by the members of the Board of Trade of Indianapolis, Ind., this season was planned for June 25. Three special cars were to be operated over the Indianapolis, Columbus & Southern Traction Company's line as far south as Scottsburg. Stops were to be made at all towns on the line. About 100 manufacturers and business men signified that they desired to take the trip.

Impeachment Proceedings Recommended.—The House judiciary committee voted unanimously on June 21, 1912, to recommend to the House that impeachment proceedings be instituted against Judge Robert W. Archbald of the United States Commerce Court before the bar of the Senate. Generally the specifications, it is understood, will allege that Judge Archbald exerted his influence with railroads in business transactions relative to culm bank deals in Pennsylvania by which he profited financially.

Proposal to Lease London & Port Stanley Railway.—The Lake Erie Coal Company, Walkerville, Ont., has asked the city of London, Ont., to answer the offer of the company to lease the London & Port Stanley Railway and electrify the line. The Port Stanley board met and considered the matter, but as the report of the engineers has not yet been presented as to the advisability of the city operating the road, no answer was given the company. It is stated that the Lake Erie Coal Company will arrange with the city to bring its coal to the city if the city will not lease the road.

Retention of Traffic Expert Authorized.—The City Council of Toronto, Ont., has passed the resolution recommended by the Board of Control authorizing L. H. Drayton, corporation counsel, to secure a railway expert to be attached to his office to advise him in regard to street railway traffic matters. The resolution also carries an appropriation to pay for such other expert assistance as may be required in connection with transportation matters. On June 24, 1912, Mr. Drayton recommended to the Council that Bion J. Arnold, Chicago, Ill., and J. M. Moyes, Toronto, should be retained as traffic experts to advise the city.

Electrification of Railway Terminals at Cleveland Discussed.—At a conference between representatives of the railroads which enter Cleveland and the members of the steam railroad committee of the Cleveland City Council on June 21, 1912, the electrification of the railroad terminals was suggested as a means of abating the smoke nuisance. It was estimated that the cost of such an improvement would be $35,000,000. At the suggestion of Director of Public Service Springborn the meeting adjourned without taking up the general discussion of the subject of electrification in order that data may be secured from the railroads as to the cost of electrification.

Electrification of Illinois Central Railroad at Chicago.—One of the clauses in the contract which has just been entered into between the Illinois Central Railroad, the South Park Commissioners and the citizens' committee of Chicago requires that the suburban service of the railroad shall be electrified before the company can take possession of the land conveyed to it by the city south of East Twenty-ninth Street. The contract has been approved by all parties concerned and is being held over one day by the court before recording, in order to permit taxpayers who have not seen the contract to come into court and voice their objections. The Illinois Central Railroad has agreed to cut down lands in certain places and reduce its extended right of way, to depress its tracks 4 ft. between East Thirty-first and East Forty-third Streets, to widen Indiana Avenue 100 ft., and dedicate property for street purposes and not to erect any buildings on the land south of East Twenty-ninth Street. Charles H. Markham, president of the company, conferred with the directors of the company in New York on June 26 in regard to the contract.

Financial and Corporate

Stock and Money Markets

June 26, 1912.

The market for securities traded in on the New York Stock Exchange opened strong to-day, and the upward movement continued into the afternoon, the market broadening into a wider range of trading. The market was around its top figures at the close, and the trading exhibited greater interest as the period for the final trade was approached. Rates in the money market to-day were: Call, 2@3 per cent; sixty days, 3@3¼ per cent; ninety days, 3¼@3½ per cent; four months, 3½@3¾ per cent.

In the Philadelphia market the extreme advance in strictly local shares was less than half a point. There was a good market for bonds.

In the Chicago market the only important transaction in traction shares was the sale of a block of Chicago Elevated Railway shares at 32. In the bond market Chicago Railways 5's were in demand.

The Boston market was strong to-day. At times there was considerable activity. The tone of the market at the close was firm.

Trading in the issues listed on the Baltimore exchange was dull and featureless to-day.

Quotations of traction and manufacturing securities as compared with last week follow:

	June 19.	June 26.
American Brake Shoe & Foundry (common)	a96½	a95
American Brake Shoe & Foundry (preferred)	a141¾	a145
American Cities Company (common)	...	33⅝
American Cities Company (preferred)	...	79⅝
American Light & Traction Company (common)	a355	a355
American Light & Traction Company (preferred)	a110	a110
American Railways Company	a43¾	a43¾
Aurora, Elgin & Chicago Railroad (common)	44½	a44
Aurora, Elgin & Chicago Railroad (preferred)	a88	a86½
Boston Elevated Railway	a128	a127
Boston Suburban Electric Companies (common)	a15	a15
Boston Suburban Electric Companies (preferred)	78	78
Boston & Worcester Electric Companies (common)	a9⅞	a9⅞
Boston & Worcester Electric Companies (preferred)	a54	a55
Brooklyn Rapid Transit Company	88	88⅛
Capital Traction Company, Washington	a125	126
Chicago City Railway	a190	a190
Chicago Elevated Railways (common)	a35	a35
Chicago Elevated Railways (preferred)	a93	a92½
Chicago Railways, ptcptg., ctf. 1	a92	a90
Chicago Railways, ptcptg., ctf. 2	a27	a25
Chicago Railways, ptcptg., ctf. 3	a9	a7
Chicago Railways, ptcptg., ctf. 4	a5	a4
Cincinnati Street Railway	a130	a130
[illegible] Railway	a104	a105
Cleveland, Southwestern & Columbus Ry. (common)	*7	*7
Cleveland, Southwestern & Columbus Ry. (preferred)	*40	*40
Columbus Railway & Light Company	a55	a55
Columbus Railway (common)	80	80
Columbus Railway (preferred)	a95	a95
Dayton Street Railway (common)	a25	a25
Dayton Street Railway (preferred)	a100	a100
Denver & Northwestern Railway	a135	*135
Detroit United Railway	a72	a70
General Electric Company	170½	174½
Georgia Railway & Electric Company (common)	a125	a125
Georgia Railway & Electric Company (preferred)	a86	a86
Interborough Metropolitan Company (common)	20½	20⅝
Interborough Metropolitan Company (preferred)	58¼	59
International Tractron Co., 4% bond, rcts	*75	*75
Indiana Union Traction Company	*7	*7
Kansas City Railway & Light Company (common)	a20	a18¼
Kansas City Railway & Light Company (preferred)	a46	a46
Lake Shore Electric Railway (common)	*7¼	*7¼
Lake Shore Electric Railway (1st preferred)	*91	*91
Lake Shore Electric Railway (2d preferred)	*25	*25
Manhattan Railway	136	134
Massachusetts Electric Companies (common)	a20	19½
Massachusetts Electric Companies (preferred)	a93	a93
Milwaukee Electric Railway & Light (preferred)	*105	*105
Norfolk Railway & Light Co	*29	*29
North American Company	82⅜	82⅝
Northern Ohio Light & Traction Company (common)	a65	a65
Northern Ohio Light & Traction Company (preferred)	a105	a105
Philadelphia Company, Pittsburgh (common)	a43¼	a53
Philadelphia Company, Pittsburgh (preferred)	52¼	a43½
Philadelphia Rapid Transit Company	a23	a23
Portland Railway, Light & Power Company	*69	*69
Public Service Corporation	a111½	a112
Third Avenue Railway, New York	a38½	38¾
Toledo Railways & Light Company	a7½	a6½
Twin City Rapid Transit Co., Minneapolis (common)	a106	a109½
United Rys. & Electric Company (Baltimore)	*24¼	24¼
United Rys. Inv. Co. (common)	a30½	29½
United Rys. Inv. Co. (preferred)	a60	58½
Virginia Railway & Power Company (common)	a50½	50½
Virginia Railway & Power Company (preferred)	*90	a87½
Washington Ry. & Electric Company (common)	a92⅞	a92
Washington Ry. & Electric Company (preferred)	a94¾	a94½
West End Street Railway, Boston (common)	a85	a85
West End Street Railway, Boston (preferred)	100½	a100½
Westinghouse Elec. & Mfg. Co	a73	74½
Westinghouse Elec. & Mfg. Co. (1st preferred)	a120	a121¾

*Last sale. a Asked.

Sale of Notes for Brooklyn Rapid Transit System

The Central Trust Company, Kuhn, Loeb & Company and Kidder, Peabody & Company have sold to a syndicate $40,000,000 of six-year 5 per cent notes of a subsidiary of the Brooklyn Rapid Transit System which they have purchased. The notes are secured by deposit of $40,000,000 of first mortgage 5 per cent bonds of a new subway company to be formed to carry out the plans of the Brooklyn Rapid Transit Company in connection with subway development in Greater New York and also by $10,000,000 of Brooklyn Rapid Transit Company convertible 4 per cent refunding bonds. The syndicate offered the notes to subscribers at 96.65. Subscribers are free to deal in the notes in any way they see fit when they receive an allotment. The notes are to be convertible into new first mortgage bonds at the option of the holder until Jan. 1, 1916. The transaction is contingent upon a favorable decision from the Court of Appeals in the preferential payment case.

T. S. Williams, president of the Brooklyn Rapid Transit Company, has described the subway contract and the plan in a letter issued by the purchasing bankers. The $40,000,000 of notes are part of an authorized issue of $60,000,000 to be dated July 1, 1912, and to mature on July 1, 1918. The notes are redeemable at the option of the company at 101 and interest on any semi-annual interest day on ninety days' notice. Payment of the notes of the new subway company, principal and interest, is to be guaranteed or assumed by the Brooklyn Rapid Transit Company and also by the Brooklyn Union Elevated Railway, which owns or operates all the elevated lines in Brooklyn and will own the entire capital stock of the new subway company. In lieu of the guarantee of the Brooklyn Union Elevated Railway there may be substituted the guarantee or assumption of a company to be formed by a consolidation of that company with the Canarsie Railway and probably the Sea Beach Railway. This guarantee or assumption is to be secured by a first mortgage upon the present and future property of the company, making such guarantee subject only to the lien of the existing mortgages on the property so covered.

The subway company which it is proposed to form will secure the issue of new bonds by a first lien on the company's lease interest in the subway and elevated lines to be constructed under the new contract with the city and upon the subway company's interest in such contract and by a lien of the highest rank permitted with the city upon all payments to be made to the subway company under such contract, upon the earnings of the subway company under the contract and upon all other property held by the subway company. A sinking fund will provide for the retirement of all of the first mortgage bonds at or before maturity. Outstanding bonds will be purchased at their market value, provided that value does not exceed the redemption price, or they will be redeemed at 107½ and accrued interest. The entire issue of bonds may be redeemed at 107½ and interest at the option of the company on ninety days' notice, but there can be no partial redemption except for the sinking fund. The interest on the new issue of bonds will be a charge not only upon the earnings of the new subway company but upon all the surplus revenue of the entire Brooklyn Rapid Transit System, which it is estimated will be approximately $3,600,000 above fixed charges for the year ending June 30, 1912. The investment in the new rapid transit lines is to include $93,000,000 by the city, exclusive of real estate, and the $60,000,000 by the new subway company. The track mileage of the new unified rapid transit system will be approximately as follows:

	Mileage.
Existing rapid transit lines	105.522
Additional tracks on existing lines	19.863
Subways and tunnels	70.580
Elevated extensions (including bridges)	73.034
Total	268.999

The net earnings of the system are to be pledged as follows:

1. To the subway company an amount equal to the annual net earnings of the Brooklyn Union Elevated Railway, Canarsie Railway and Sea Beach Railway.

2. To the subway company an amount equal to 6 per cent per year on the sum invested by this company in construc-

tion and equipment, which on $60,000,000 would aggregate $3,600,000, equivalent to interest at 5 per cent and sinking fund at 1 per cent on the new bonds.

3. To the city interest and sinking fund on its investment.

4. The remaining net earnings will be divided equally between the subway company and the city.

The preferential payments to the subway company are accumulative. The following estimate of net and gross earnings has been made by the Brooklyn Rapid Transit Company and the experts of the city:

	1917.	1920.	1925.
Gross earnings	$19,250,000	$24,200,000	$32,300,000
Net, 50 per cent	9,625,000	12,100,000	16,150,000
Preferentials to company*	7,100,000	7,100,000	7,100,000
Surplus over preferential	2,525,000	†5,000,000	9,050,000

*This figure does not include other surplus revenue of the Brooklyn Rapid Transit system. †More than enough to pay full interest and sinking fund on city's investment of $93,000,000.

Merger of Brazilian Companies Proposed

It is proposed to organize the Brazilian Traction, Light & Power Company, Ltd., to take over the properties of the Rio de Janeiro Tramway, Light & Power Company, Ltd., the Sao Paulo Tramway, Light & Power Company, Ltd., and the Sao Paulo Electric Company, Ltd. The new company will have an authorized capital of $120,000,000, made up of $70,000,000 common stock and $50,000,000 of 6 per cent participating non-cumulative preferred stock. The official statement says in part:

"After careful consideration the directors of the Rio de Janeiro Tramway, Light & Power Company, Ltd., the Sao Paulo Tramway, Light & Power Company and the Sao Paulo Electric Company, Ltd., decided that it would be advisable in the interest of the shareholders to bring the three companies together through an exchange of shares for the shares of the Brazilian Traction, Light & Power Company, Ltd. The basis of exchange agreed upon is believed to be equitable, and the boards of the various companies will recommend their shareholders to make the exchange of shares.

"The Brazilian Traction, Light & Power Company, Ltd., is to be organized under the laws of the Dominion of Canada, with the following board of directors and officers, and with its head office at Toronto, Can.: Sir William MacKenzie, Toronto, chairman; F. S. Pearson, London, president; E. R. Wood, D. B. Hanna, Z. A. Lash, Miller Lash, Sir H. M. Pellatt, all of Toronto; Sir William Van Horne, Montreal; Alexander Mackenzie, Rio de Janeiro; H. Malcolm Hubbard, London; Alfredo Maia, Rio de Janeiro; R. M. Horne-Payne, London; Percival Farquhar, Paris; J. M. Smith, treasurer. There will also be a director from each of the cities of Paris and Brussels, representing the interests in France and Belgium.

"The authorized capital of the new company is $120,000,000, being made up $70,000,000 of ordinary shares and $50,000,000 of 6 per cent participating non-cumulative preference shares. The preference shareholders will participate in the profits of the company after the payment of the dividend of 9 per cent on the ordinary stock, the participation being pro rata among the preference and ordinary shareholders, according to the numbers of shares held by them.

"The proposed consolidation will be made through an exchange of shares on the basis of: the Rio de Janeiro Tramway, Light & Power Company, Ltd., eight-tenths of a share of preference stock and eight-tenths of a share of ordinary stock of the new company for each share of old; the Sao Paulo Tramway, Light & Power Company, Ltd., 1¼ shares of preference stock and 1¼ shares of ordinary stock of the new company for each share of old; the Sao Paulo Electric Company, Ltd., one share of ordinary stock of the new company for each share of old.

"The balance of the shares of the Brazilian Traction, Light & Power Company, Ltd., will be retained in the treasury of the company for future purposes.

"To provide funds for the future development of the tramways and lighting system of the Sao Paulo Tramway, Light & Power Company, Ltd., and for a working capital for the new company, arrangements have been made to underwrite $5,000,000, par value, of the ordinary stock of the new company, but shareholders of the new company will be given the right to subscribe to this issue after the exchange of securities has been completed."

American Cities Railway & Light Company, New York, N. Y.—Hugh McCloskey, president of the New Orleans Railway & Light Company, and R. L. Montgomery, of Montgomery, Clothier & Tyler, Philadelphia, Pa., have been elected directors of the American Cities Railway & Light Company to succeed Fernand Lapeyre, deceased, and to fill a vacancy.

Arkansas Valley Railway, Light & Power Company, Pueblo, Col.—An initial quarterly dividend of 1¾ per cent was paid on June 15, 1912, to the holders of the $500,000 of 7 per cent cumulative preferred stock of the Arkansas Valley Railway, Light & Power Company of record on May 31.

Birmingham Railway, Light & Power Company, Birmingham, Ala.—The Birmingham Railway, Light & Power Company has purchased the Birmingham & Edgewood Electric Railway, operating 4½ miles of line between Birmingham, Rosedale, Oak Grove and Edgewood.

Brooklyn (N. Y.) Rapid Transit Company.—Appeal will be taken by the Brooklyn City Railroad from the decision of the Appellate Division of the State Supreme Court of New York awarding $1,749,000 and interest from March 1, 1910, to the Brooklyn Heights Railroad for expenses incurred in electrifying the Brooklyn City Railroad prior to 1894.

Coney Island & Brooklyn Railroad, Brooklyn, N. Y.—Col. T. S. Williams, president of the Brooklyn Rapid Transit Company, has denied that the company has secured control of the Coney Island & Brooklyn Railroad, either directly or indirectly.

Interborough Rapid Transit Company, New York, N. Y.—A special dividend of 5 per cent has been declared on the $35,000,000 of stock of the Interborough Rapid Transit Company, payable to holders of record on June 19. The dividend payment will be made mainly from the surplus profits of the Rapid Transit Subway Construction Company, all of whose $6,000,000 of stock is owned by the Interborough Rapid Transit Company. This is the first dividend paid by the Rapid Transit Construction Company since its organization in 1900. The dividend calls for $1,750,000, of which $1,695,640 goes to the Interborough-Metropolitan Company as the holder of $33,912,800 of the stock of the Interborough Rapid Transit Company. The $1,695,640 is equivalent to about 3.7 per cent on the $45,740,000 of 5 per cent non-cumulative preferred stock of the Interborough-Metropolitan Company.

Lehigh Valley Transit Company, Allentown, Pa.—Charles H. Bean, of C. H. Bean & Company, Philadelphia, Pa., has been elected a director of the Lehigh Valley Transit Company. Bean & Company recently purchased for interests friendly to the Lehigh Valley Transit Company half of the holdings of the late William F. Harrity in the common and preferred stocks of the company.

Louisville (Ky.) Railway.—A special committee composed of Charles T. Ballard, Samuel Casseday and L. W. Botts has been appointed by the Louisville Railway to investigate the methods used in the accounting department of the company, especially with reference to capitalizing the expenditures for improvements instead of charging them to maintenance as is now done.

Dividends Declared

Auburn & Syracuse Electric Railroad, Syracuse, N. Y., quarterly, 1½ per cent, preferred.

Bangor Railway & Electric Company, Bangor, Me., quarterly, 1¾ per cent, preferred.

Birmingham Railway, Light & Power Company, Birmingham, Ala., 3 per cent, preferred; 4 per cent, common.

Boston & Worcester Electric Companies, Boston, Mass., $1 preferred.

Chicago City & Connecting Railways, Chicago, Ill., $2.25 preferred; $1, common.

Chippewa Valley Railway, Light & Power Company, quarterly, 1¾ per cent, preferred.

Cincinnati, Dayton & Toledo Traction Company, Cincinnati, Ohio, 2½ per cent, preferred; ¾ of 1 per cent, common.

Cincinnati, Newport & Covington Light & Traction Company, Covington, Ky., quarterly, 1⅛ per cent, preferred; quarterly, 1⅜ per cent, common.

Columbia Railway, Gas & Electric Company, Columbia, S. C., quarterly, 1½ per cent, preferred.

Columbus (Ga.) Electric Company, 3 per cent, preferred.

Germantown Passenger Railway, Philadelphia, Pa., quarterly, $1.31¼.

Interstate Railways, Philadelphia, Pa., 3 per cent.

Little Rock Railway & Electric Company, Little Rock, Ark., 3 per cent, preferred; 5 per cent, common.

London (Ont.) Street Railway, 3 per cent.

Metropolitan West Side Elevated Railway, Chicago, Ill., 2 per cent, preferred.

Ottawa (Ont.) Electric Railway, 2½ per cent.

Pacific Gas & Electric Company, San Francisco, Cal., quarterly, 1¼ per cent, common.

Philadelphia (Pa.) Company, quarterly, 1¾ per cent, common.

Reading (Pa.) Traction Company, 75 cents.

Republic Railway & Light Company, Youngstown, Ohio, quarterly, 1½ per cent, preferred.

Ridge Avenue Passenger Railway, Philadelphia, Pa., quarterly, $3.

Rome Railway & Electric Company, Rome, Ga., quarterly, 1½ per cent.

South Side Elevated Railway, Chicago, Ill., 2⅞ per cent.

Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., quarterly, 1¼ per cent, preferred.

Thirteenth & Fifteenth Streets Passenger Railway, Philadelphia, Pa., $6.

Tri-City Railway & Light Company, Davenport, Ia., quarterly, 1½ per cent, preferred.

Western Ohio Railway, Lima, Ohio, quarterly, 1¾ per cent, first preferred; quarterly, 1½ per cent, second preferred.

Winnipeg (Man.) Electric Railway, quarterly, 3 per cent.

ELECTRIC RAILWAY MONTHLY EARNINGS

BATON ROUGE ELECTRIC COMPANY.

Period			Gross Earnings.	Operating Expenses.	Net Earnings.	Fixed Charges.	Net Surplus.
1m.,	Apr.,	'12	$11,129	*$7,071	$4,058	$1,730	$2,323
1 "	"	'11	8,818	*5,984	2,834	1,730	1,105
12 "	"	'12	128,469	*78,366	50,104	20,745	29,359
12 "	"	'11	112,166	*73,073	39,093	20,682	18,411

BROCKTON & PLYMOUTH STREET RAILWAY.

1m.,	Apr.,	'12	$8,286	*$6,517	$1,768	$1,050	$718
1 "	"	'11	8,277	*7,119	1,158	1,103	55
12 "	"	'12	119,575	*99,229	29,346	12,694	16,653
12 "	"	'11	119,600	*89,266	30,335	13,426	16,909

EL PASO ELECTRIC COMPANY.

1m.,	Apr.,	'12	$58,110	*$33,617	$24,493	$6,682	$17,811
1 "	"	'11	53,695	*32,342	21,353	6,677	14,677
12 "	"	'12	716,788	*407,026	309,762	82,417	227,344
12 "	"	'11	655,195	*399,810	255,385	80,162	175,223

GALVESTON ELECTRIC COMPANY.

1m.,	Apr.,	'12	$33,841	*$20,622	$13,219	$7,754	$5,465
1 "	"	'11	34,622	*19,097	15,526	6,795	8,730
12 "	"	'12	455,076	*261,888	193,188	88,350	104,838
12 "	"	'11	385,904	*232,243	153,661	80,249	73,413

NORTHERN TEXAS ELECTRIC COMPANY.

1m.,	Apr.,	'12	$134,936	*$73,200	$61,736	$20,845	$40,891
1 "	"	'11	126,681	*71,546	71,546	20,831	34,204
12 "	"	'12	1,622,470	*888,282	734,188	251,441	482,746
12 "	"	'11	1,506,633	*839,837	666,795	216,804	449,992

PENSACOLA ELECTRIC COMPANY.

1m.,	Apr.,	'12	$22,491	*$14,759	$7,732	$6,377	$1,355
1 "	"	'11	22,734	*14,113	8,621	4,975	3,646
12 "	"	'12	286,528	*180,738	105,790	66,832	38,958
12 "	"	'11	279,149	*173,695	105,453	55,460	49,993

SAVANNAH ELECTRIC COMPANY.

1m.,	Apr.,	'12	$60,721	*$44,763	$15,958	$15,953	$6
1 "	"	'11	55,395	*39,993	15,402	15,384	19
12 "	"	'12	717,590	*529,791	187,799	186,667	1,132
12 "	"	'11	651,331	*468,377	182,955	181,847	1,108

TAMPA ELECTRIC COMPANY.

1m.,	Apr.,	'12	$62,395	*$34,077	$28,317	$4,361	$23,956
1 "	"	'11	55,309	*30,265	25,044	5,397	19,648
12 "	"	'12	713,514	*388,234	325,280	57,671	267,610
12 "	"	'11	603,567	*343,688	259,879	53,308	206,571

VIRGINIA RAILWAY & POWER COMPANY.

1 m.,	Apr.,	'12	$375,171	$193,172	$181,999	...	$186,924
1 m.,	Apr.,	'11	359,216	190,750	168,465	...	171,489
10 m.,	Apr.,	'12	3,790,191	2,008,845	1,781,346	...	1,838,684
10 m.,	Apr.,	'11	3,594,462	1,924,140	1,670,323	...	1,695,596

*Includes taxes.
†Deficit.

Traffic and Transportation

Loyalty

R. J. Moore, contract agent of the Portland Railway, Light & Power Company, Portland, Ore., addressed the members of the Electric Club, composed of employees of the company, recently, taking for his subject "The Business Getter." Mr. Moore's remarks, however, covered a range of subjects much broader than is indicated by the title of his address. He carried a message to the employees of the company which the employees of other public service corporations would do well to ponder. Among other things Mr. Moore said:

"The composite picture—word picture—of the business man is painted with four big nouns—Knowledge, Tact, Courtesy and Loyalty. Knowledge of the business in which he is engaged and ability to present his information in a clear, convincing and impressive manner. Tact, an acquired achievement, the steering wheel of his intellect, which guides the machine of act and word from barbed-wire fences and rock piles in the commercial highway. Courtesy, the paint on the house, the polished stone, the innate roughness arrayed in evening dress, which charms, delights and fascinates. And loyalty—the greatest of all of these is loyalty. The disloyal man has no place on this earth. You do not find his likeness in the hall of fame. It is more properly hung in the rogues' gallery. The employee who has no interest other than a perfunctory one in his employer's business and merely works enough to hold his job is a parasite, but a disloyal employee is a cancer which eats and grows continually at the very vitals of the organization. The loyal employee is of far more value than the clever one. Brains and ability are beautiful flowers; loyalty is the ripened fruit. You may possess knowledge, tact and courtesy, but if loyalty is not yours you occupy the position of the rich young man who had kept all the commandments from his youth up but when told to sell his possessions and 'follow me' turned away sorrowfully.

"There should exist a bond of feeling between employer and employee greater and more far-reaching than the mere relationship which two conditions impose, the rendition of service and acceptance of a pay check at the end of the month. The office boy, the humblest helper should have a feeling and interest in the concern's affairs as though he owned a majority of the stock and the success of the institution rested on his ablest efforts. The employer should make his helper feel that he is a vital part of the institution and give a fitting recognition when occasion demands. The time will come some of those days when the quasi public service corporation will pension its true and faithful and efficient help after a period of useful years, and the man who makes up his mind to live and die with the corporation he enlists with will put forth his greatest energy, brain and soul in making the most efficient employee it is within his power to be, for at the end of a useful career there is a reward that will keep him in the twilight of life.

"Good treatment, consideration, a manifest interest in the employee are the best and surest means of securing his sincerest efforts. The man who constantly feels the fear and dread that some day he is going to be 'let out' is incapable of rendering the best service. He cannot be 100 per cent efficient. He cannot carry a 50 per cent overload when the peak is on. The maximum demand for good men is on twenty-four hours in the day, and on the chart of a graphic recording instrument of his career there is no gap in the red lines indicating a non-employment period.

"Herbert Spencer, the philosopher, said: 'The vital knowledge is a knowledge that has got itself taught in nooks and corners, while the ordained agencies for teaching have been numbering little else but dead formulas. That which our school courses leave almost entirely out we thus find to be that which most nearly concerns the business life. All our industries would cease were it not for that information which men begin to acquire as they best may after their education is said to be finished, and were it not for this information that has been from age to age accumulating and spread by unofficial means these industries would never have existed.'

"A sheepskin is not a passport to success in any field of endeavor. Education is experience. The use of education is the proper application of correctly acquired experience. The best and most practical education in the world is the thorough understanding of human nature. If you first know man, his strength and character, his faults and foibles, the rest is easy. You can't learn to be a business man from books. You have got to dig it out with the pick and shovel of personal contact and profit by the experience this personal contact entails."

Accidents in Indiana for the Quarter

The Railroad Commission of Indiana has issued Bulletin No. 19, which contains a summary of the accidents on the steam railroads and the electric railways operated in Indiana for the three months ended March 31, 1912, compared with the corresponding quarter in 1911. The total number of deaths from accidents in the first quarter of 1912 was four, the same as for the corresponding period of 1911, but the total number of injured during the first quarter of 1912 was only thirty-three, compared with sixty-four for the same period of 1911. The comparative record of casualties on the interurban railways as made public by the commission follows:

	1911 Third Quarter	1912 Third Quarter
PASSENGERS.		
WHERE—		
On passenger trains	15	40
On station grounds	0	0
CAUSES—		
Collisions	8	28
Derailments	3	12
Getting on and off moving trains	1	0
Getting on and off trains after stops are made	1	0
Miscellaneous	2	0
RESULTS—		
Deaths	0	0
Fractures and dislocations	0	5
Sprains	1	10
Cuts and bruises	1	24
Miscellaneous	13	1
HIGHWAYS.		
WHERE—		
In vehicles	6	4
On foot	2	2
CAUSES—		
Struck on crossing	7	5
Teams frightened	0	0
Miscellaneous	1	1
RESULTS—		
Deaths	0	1
Sprains	2	1
Cuts and bruises	4	4
Miscellaneous	1	0
Loss of limb	1	0
EMPLOYEES.		
EMPLOYMENT—		
Conductors	2	5
Motormen	3	7
Laborers	2	7
Brakemen	0	1
CAUSES—		
Collisions	1	13
Miscellaneous	1	0
Getting on and off trains	2	0
Derailment	3	7
RESULTS—		
Deaths	0	2
Fractures or dislocations	1	2
Sprains	1	1
Cuts and bruises	5	14
Miscellaneous	0	0
Loss of limb	0	1
TO TRESPASSERS.		
WHERE—		
Trespassers on tracks	7	1
Miscellaneous	1	1
RESULTS—		
Deaths	4	1
Fractures or dislocations	2	0
Cut and bruised	2	1

Decision in New Jersey Transfer Case

The Court of Errors and Appeals of New Jersey has upheld the mandatory part of the order of the Board of Public Utility Commissioners to the Public Service Railway in regard to the issuance of transfers upon intersecting and connecting lines in Newark. The court said in part:

"The writ in this case brings up for review a judgment of the Supreme Court affirming an order made by the Board of Public Utility Commissioners in August, 1911, directing the Public Service Railway to issue transfers at specified connecting points where theretofore they had not been issued by the company. The Supreme Court affirmed the order of the board, and in our opinion that affirmance was proper, for the reasons set forth in the opinion delivered by the Supreme Court.

"In order to avoid misapprehension we deem it proper to add that we do not understand the Supreme Court by its decision to have affirmed the findings recited in the order of the board, but merely the mandatory part of that order. The findings to which we refer are:

"'The Public Service Railway is legally bound to give a transfer to any passenger paying the fare of 5 cents upon any of its cars, such transfers entitling the passenger to a continuous ride in either direction on any street railway line intersecting with or connecting with the line upon which said transfer was given; and further, that the requirement to give such transfers may not be restricted or limited to a line that may take the passenger without further change to his ultimate destination, but that transfers must be given on any intersecting or connecting line that advances the passenger continuously toward his ultimate destination, even though a re-transfer is required to bring him to his ultimate destination.'

"The various ordinances of the city of Newark upon which these findings are based, and which are specifically referred to in the opinion of the Supreme Court, do not, in our judgment, support the conclusion that by force thereof the Public Service Railway is required to furnish transfers on any intersecting or connecting line that advances the passenger continuously toward his ultimate destination, even though a re-transfer is required to bring him to it."

Free Transportation for New York's Poor Children.—T. P. Shonts, president of the Interborough Rapid Transit Company, New York, N. Y., has written to Mayor Gaynor repeating the offer he made last year to the city to carry free of charge poor children and their mothers to and from Bronx Park and Van Cortlandt Park.

Change in Operating Equipment for Car Doors at Cleveland.—Street Railway Commissioner Witt of Cleveland, Ohio, has advised the use of a wheel and chain instead of a lever for opening and closing the double rear doors of the pay-as-you-enter cars of the Cleveland Railway. This idea was perfected under M. Scullin, master mechanic of the Cleveland Railway, and a few of the cars have been equipped with the device.

Arbitration of Service Conditions in New Haven.—The conditions of service to govern the employees of the Connecticut Company in New Haven, Conn., will be submitted to a board of three arbitrators, one to represent the men, one the company and the third to be chosen by the first two. The motormen and conductors on the other divisions of the company have accepted the wage scale and working conditions as fixed by the company.

Accidents in New York City During May.—The Public Service Commission of the First District of New York has received the report of its transportation department in regard to the accidents on railroads and street railways in the First District for May, 1912. The report shows a total of 6,462 accidents for the month, 4,049 of which resulted in injuries. Thirty-three persons were killed in the month and 164 were seriously injured.

Special Edition of Trolley News.—The United Railways & Electric Company, Baltimore, Md., made the issue of *Trolley News* for June 22, 1912, a special one in view of the Democratic convention in that city. A large map of the city showing the street car lines was published. On this the location of the convention hall was indicated plainly and a key was furnished to the different lines of the company. A page was devoted to places of general interest in and around Baltimore. The schedule of the all-night cars was published.

Los Angeles Fare Case Not to Be Appealed.—The Pacific Electric Railway, Los Angeles, Cal., has asked Judge Wood of the Superior Court to dismiss the recent notice of an appeal of the Colegrove fare case. Judge Wood held that, under the laws of 1878 prohibiting railways in cities of more than 100,000 population charging more than 5 cents for one continuous ride in one direction within the city limits, the Pacific Electric Railway was liable to damages for charging 10 cents from Colegrove to the downtown section of Los Angeles.

Service Question in Seneca Falls.—The Public Service Commission of the Second District of New York has closed upon its records the complaint of residents of Seneca Falls, N. Y., against the Geneva & Auburn Railway as to stopping cars on that line in Seneca Falls. At a hearing held at Seneca Falls a readjustment of stops was arranged which was satisfactory to both sides. Count is to be kept of the passengers who take cars at a point between State and Cayuga Streets, and if within three months a stop at that point is not shown to be necessary the case may be reopened and the commission will consider the matter of ordering the company to discontinue the stop.

Arbitration of Wage Question in Springfield and Worcester.—F. H. Dewey, president of the Worcester (Mass.) Consolidated Street Railway, has been chosen by the New England Investment & Security Company to represent it as a member of the board of arbitration of three which is to consider the question of wages to be paid the men in the company's employ. The men have chosen William P. Hayes to represent them. The third member of the board will be selected jointly by Mr. Dewey and Mr. Hayes. As previously stated in the ELECTRIC RAILWAY JOURNAL, a satisfactory agreement has been reached in regard to the other questions which were discussed by the company and the men.

Reduction in Fare Asked in Massachusetts.—Selectmen and citizens of Stoughton, Mass., have petitioned the Massachusetts Railroad Commission for an all-day 5-cent fare between Stoughton and Brockton. The Bay State Street Railway now grants a 5-cent fare at certain hours, and at other hours the fare is 10 cents. The 5-cent fare is given to benefit persons who work in Brockton and live in Stoughton, but the workers complain that women shop in the city and take advantage of the lower fare, crowding the cars. The plea is advanced that an all-day 5-cent fare would relieve the congested condition of the cars at special hours. The chairman of the commission has ruled that on this petition it will consider the character of the service rendered by the company and not the question of fares.

Report of Montreal Tramways Mutual Benefit Association.—The report of the Montreal Tramways Mutual Benefit Association for the year ended April 30, 1912, was presented at the annual meeting of the members held on June 20, 1912. This association is composed of employees of the Montreal Street Railway, who pay $1 to join and 50 cents per month to secure sick and death benefits. The report shows that the expenses for the fiscal year ended April 30, 1912, were $34,939. The association has invested $86,688 and has $8,711 in cash on deposit in its bank. Since the organization of the association on Oct. 1, 1903, a total of $166,094 has been paid out in sick and death benefits, pensions, etc. A very interesting feature of the report is a list of investments of the association, which yield 5.95 per cent income.

Service in Albany.—The Public Service Commission of the Second District of New York has received an answer from the United Traction Company, Albany, N. Y., in the matter of the complaint of patrons of the West Albany line as to the alleged reduction in service on Watervliet Avenue between Central Avenue and West Albany. The company's answer states that the only change made in the schedule for the operation of its cars to and from the West Albany terminal since May 20, 1912, the date on which it began the operation of cars to the West City Line, is that between 6.12 a. m. and 8.52 p. m. every fourth car, instead of running to the West Albany terminal, runs to the West City Line, and at such times the greatest interval between cars in either direction on Watervliet Avenue is ten minutes, and at all other times the greatest interval between the hours stated is five minutes. The company maintains that this is adequate service on Watervliet Avenue.

Interchange of Traffic Ordered in Canada.—A joint meeting of the Board of Railway Commissioners of Canada and the Ontario Railway & Municipal Board was held in Galt, Ont., on June 20, 1912, to consider the application of the Boards of Trade of Galt for an order to direct the Grand Trunk Railway, the Galt, Preston & Hespeler Street Railway and the Preston & Berlin Railway to connect their lines in places mentioned in the application. After hearing the evidence, the joint commission ordered an interchange between the Galt, Preston & Hespeler Street Railway and the Grand Trunk Railway at a location to be mutually agreed upon, the engineer of the Dominion Railway Board to make the selection if the representatives of the railways disagree in regard to the location of the connecting track. The question of the distribution of cost will be decided later. The commission also reserved decision as to what rates should be charged for interswitching. A similar decision was reached in regard to the connection between the Grand Trunk Railway and the Preston & Berlin Railway.

Passage of Express Ordinances Recommended in Los Angeles.—The committee on legislation of the City Council of Los Angeles, Cal., has recommended the passage of the express and freight carrying ordinances for the Pacific Electric Railway as drafted by the Board of Public Utilities. One ordinance is intended to give the company the privilege of hauling express on Main, Seventh, Ninth, Sixth and Hill Streets. This permit is to be revocable at any time by the Board of Public Utilities. The second ordinance provides for a temporary freight-carrying permit on Sixth Street under which the company is to pay the city 5 cents per car mile for the privilege. The third ordinance provides for twenty-one-year freight franchises in the industrial district of the city. Under this franchise the Pacific Electric Railway proposes to haul freight on Ninth Street east of Main Street, Seventh Street east of Los Angeles Street, Sixth Street east of Los Angeles Street, Los Angeles Street north of First Street, and on Aliso Street to the company's private right-of-way for the Pasadena short line and across certain streets in the Rose Hill district. For this last franchise the company will pay the city $1,500 a year minimum and 1 cent for each car mile, whether full or empty.

Suit to Force Universal Transfers on Elevated Railways in Chicago.—Six suits were filed in the Municipal Court at Chicago on June 25, 1912, by the corporation counsel for the City of Chicago against each of the elevated railways in Chicago. The purpose of the suits is to enforce the universal transfer ordinance passed by the City Council on May 20, as noted in the ELECTRIC RAILWAY JOURNAL of June 1, 1912, page 947. Counsel for the city contends that Samuel Insull, Ira M. Cobe and Henry A. Blair, who have been made parties to one of the suits, control 98 per cent of the stock of the Northwestern, Metropolitan and South Side elevated railway companies, and that this condition, in conjunction with the fact that Britton I. Budd is joint operating manager of all roads, is sufficient to establish common ownership and management. It is understood that counsel for the elevated railways will contend that the ordinance is confiscatory and unjust and that its enforcement would reduce profits to an unfair point, and will deny common ownership of the properties. The requirement in the ordinance on which the suit is based reads that all roads either elevated or surface, shall issue transfers to other lines operated or owned jointly with them, if the two lines intersect or come within 200 ft. of each other.

Express Franchise Refused by Syracuse Company.—The Syracuse (N. Y.) Rapid Transit Company has rejected the franchise passed by the Council of Syracuse on April 6, 1912, giving it the right to carry freight. In its letter to the Mayor and the Council the company says: "The Syracuse Rapid Transit Railway cannot accept the franchise known as the 'express franchise,' passed by the Common Council on April 6, 1912. The principal objection is to paragraph 6, relating to transfers and traffic agreements. The company does not own or control the other companies operating in the city. The company should be protected in the express franchise in case of change in the location of any line whereby it would be obligated to operate a different route. Paragraph 1 makes it obligatory to operate on each line one express car each way each day on the routes mentioned in the franchise. The company cannot accept this provision, as it would be compelled to operate where there is not enough business to warrant daily service. Paragraph 4 would prevent the possible transportation of milk and other perishable commodities which must be handled early in the morning. Assuming that the objectionable features above referred to are eliminated from the franchise, the company would waive its request for a fifty-year franchise and accept one for the period you have designated, namely, twenty-five years."

Personal Mention

Mr. John B. Parsons, formerly president of the Philadelphia (Pa.) Rapid Transit Company, has been elected president of the Philadelphia Traction Company to succeed the late George D. Widener.

Mr. G. R. Dobbin has been elected secretary of the Michigan United Traction Company, Jackson, Mich., to succeed Mr. R. W. Morrison, Jr., resigned. Mr. Dobbin was formerly connected with Hodenpyl, Hardy & Company, New York, N. Y.

Mr. R. T. Guppy, formerly connected with the Southern Pacific Railroad in connection with suburban electrification construction for Oakland, Berkeley and Alameda, has been appointed to take charge of the electrification of the Southern Pacific Railroad's lines out of Portland, Ore.

Mr. J. L. Crider, formerly with the Baltimore & Ohio Railroad and lately chief engineer of the New York, Westchester & Boston Railroad, has been engaged by J. G. White & Company, Inc., New York, N. Y., as construction superintendent on the Oakland, Antioch & Eastern Railway, which is an extension of the Oakland & Antioch Railway.

Mr. L. T. Peck, president of the Honolulu Rapid Transit & Land Company, Honolulu, Hawaii, is on a visit to the United States. While he is here Mr. Peck will take up with the federal authorities in Washington the matter of securing a permit for the construction of an extension of the company's line from Honolulu to Pearl Harbor, part of which will have to be built over a government reservation.

Mr. Robert Morrison, Jr., for the last six years secretary and treasurer of the Michigan United Railways, Jackson, Mich., and later secretary of the Michigan United Traction Company, has resigned his position with the latter company, to take effect July 1. This change is made by Mr. Morrison in order that he may give closer personal attention to his interests in the Georgia Power Company, of Atlanta, Ga., of which company he is auditor. He will retain his connection with the Michigan United Railways as treasurer and will continue to reside in Jackson.

Mr. Allan Gordon Armstrong, who has been connected with the accounting and auditing department of the New York Railways, successors of the Metropolitan Street Railway, New York, N. Y., for the last four years, has resigned from that company to become auditor of the New York, Auburn & South Lansing Railroad; the Ithaca-Auburn Short Line, operating a steam road between Ithaca and Auburn, and the Ithaca Street Railway. His headquarters will be in Ithaca, N. Y. Before he became connected with the Metropolitan Street Railway Mr. Armstrong was for nine years with the Norfolk & Portsmouth Traction Company, formerly the Norfolk Railway & Light Company, which is now merged with the Virginia Railway & Power Company.

Mr. Theodore P. Shonts has resigned as president of the Chicago & Alton Railroad, effective on July 1, 1912. In addition to the other offices which he holds Mr. Shonts has since Jan. 1, 1912, been the active head of the New York Railways, operating surface lines in New York City. In view of this increase in his duties and also in view of the proposed agreement between the Interborough Rapid Transit Company, of which Mr. Shonts is president, and the city of New York, involving the enlargement of the subway system throughout the greater city, the completion of the third track upon the elevated lines of the Manhattan Railway and the extension of the elevated railways, he has found it advisable so far as possible to relieve himself of the active management of other properties.

Mr. H. K. Eggleston, roadmaster of the recently completed New York, Westchester & Boston Railway, New York, N. Y., has been appointed steam railroad inspector of the Public Service Commission of the Second District of New York to succeed Mr. W. L. Derr, resigned. Mr. Eggleston has had twenty years' experience in practical railroad maintenance and operation. He began his career with the New York Central & Hudson River Railroad and was advanced through the various positions of every branch of track work to assistant supervisor. Subsequently he was appointed supervisor of track, bridges and buildings for the Central New England Railway. He resigned this last position to become general roadmaster of the New York, Westchester & Boston Railway in charge of all of the track work incidental to placing this railway in operation.

Mr. J. R. Harrigan has been appointed general manager of the Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo. Mr. Harrigan was formerly vice-president, treasurer and general manager of the Des Moines (Ia.) City Railway and the Inter Urban Railway, Des Moines. Mr. Harrigan has long been connected with electric railway work. He was at one time general manager of the Chippewa Valley Electric Railway, Eau Claire, Wis., and before that for a year, in 1901, was general superintendent of the Dayton, Springfield & Urbana Railroad under Mr. A. E. Appleyard. In 1902 he became general manager of the Columbus, Buckeye Lake & Newark Traction Company and the Columbus, Newark & Zanesville Railway and remained in that capacity until the roads were purchased by the so-called Widener-Elkins Syndicate. In 1906 he assumed the management of the Canton-Akron Railway, another Tucker-Anthony property, and was general manager of the company until it was absorbed by the Northern Ohio Traction & Light Company. In January, 1907, Mr. Harrigan was appointed assistant general manager of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y. Subsequently he became general manager of the Columbus, Delaware & Marion Railway, Columbus, Ohio.

Mr. W. H. Collins, general manager of the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., was elected president for the coming year of the New York Electric Railway Association at the annual meeting of the association held at Saratoga, N. Y., on June 26 and 27, 1912. Mr. Collins entered railway service in 1881 as timekeeper on the extension of the Delaware, Lackawanna & Western Railroad between Binghamton and Buffalo. From 1883 to 1888 Mr. Collins was successively in the employ of the Geneva, Ithaca & Sayre, Elmira, Corning & Northern, Southern Central and West Shore Railroads, as agent and operator. On Jan. 1, 1888, he entered the motive power department of the West Shore Railroad, at the Frankfort shops, and served in various capacities until June 1, 1891, when he was appointed assistant to the master mechanic of the Western division at Buffalo. He remained at Buffalo until Jan. 1, 1898, when he was appointed assistant master mechanic of the Fonda, Johnstown & Gloversville Railroad. On Jan. 1, 1903, he was appointed master mechanic of the company and in June, 1907, he was appointed general superintendent of the company. In 1909 he was appointed general manager of the company. Mr. Collins was vice-president of the Street Railway Association of the State of New York this last year and has been active as a member of the executive committee of the association. He has served also on other committees, including the one on interurban rules last year. He has also served on committees of the American Electric Railway Association and is at present a member of the committee on interurban rules of that association. He is a member of the American Railway Master Mechanics' Association

W. H. Collins

Bertron, Griscom & Jenks, New York, N. Y., Montgomery, Clothier & Tyler, Philadelphia, Pa., and Hallgarten & Company, New York, N. Y., are offering for subscription at 97½ and interest to yield 6 per cent $5,500,000 of three-year convertible 5 per cent secured gold notes of the United Gas & Electric Corporation dated April 1, 1912, and due April 1, 1915. The notes are convertible after April 1, 1914, stock, par for par.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Tyler City Light & Railway Company, Tyler City, Del.**—Incorporated in Delaware with a capital stock of $325,000. George M. Osgoodby, Dayton, is interested.

***Georgia Traction Company, Macon, Ga.**—Application for a charter has been made by this company in Georgia to build a 12-mile electric railway in Macon and into the suburbs. Capital stock, $150,000. Incorporators: W. J. Massee, J. T. Nathan and James L. Anderson.

***Michigan, Lakeside & St. Joe Electric Railway, Michigan City, Ind.**—Application for a charter has been made in Michigan by this company to build a 40-mile electric railway to connect Michigan City (Ind.), St. Joe (Mich.), New Buffalo and Union Pier. From New Buffalo to Union Pier, 7 miles, the abandoned line of the Père Marquette Railroad will be converted into an electric line and used as a part of this railway. Capital stock, $750,000.

***Colfax (Ia.) Northern Railway.**—Incorporated in Iowa to build an electric railway in Colfax. Capital stock, $100,000. Incorporators: Thomas W. Griggs, J. C. Dewese and W. Blackeley.

New Orleans & Western Railway, Gretna, La.—Application for a charter has been made in Louisiana by this company to build an electric railway from Gretna to Waggaman. The company will obtain its power from the Algiers Railway & Light Company. The franchise under which the company will operate is that which was purchased from Leo C. Marrero. Capital stock, $1,500,000. Officers: C. D. Warren, president, and E. Howard McCaleb, secretary. [E. R. J., June 15, '12.]

***Clarksville & Dunbar Cave Railroad, Clarksville, Tenn.**—Incorporated in Tennessee to build an electric railway from Clarksville to Dunbar Cave, Montgomery County. Capital stock, $50,000. Incorporators: A. C. Murray, Leopold Black, A. R. Gholston, J. T. Cunningham and Austin Peay.

FRANCHISES

***Birmingham, Ala.**—The Kelley Street Railway has asked the City Commissioners for a franchise to build an electric railway over certain streets in Birmingham. George C. Kelley and N. L. Miller, Birmingham, are the promoters.

***Prince Albert, Alta.**—Robert A. Grant, Winnipeg, has asked the Council for a franchise for an electric railway in Prince Albert.

Colton, Cal.—The Pacific Electric Railway has received a franchise in Colton.

Sacramento, Cal.—The Oakland, Antioch & Eastern Railway has received permission from the Council to withdraw its three applications for franchises in Sacramento and to introduce another franchise for thirty-five years for an electric railway on M Street.

Hartford, Conn.—The Public Utilities Commission has granted the petitions of the Connecticut Company for the approval of methods of reconstruction and construction of tracks in Meriden, Yalesville, Southington, Waterbury and New London.

Atlanta, Ga.—The Georgia Railway & Power Company has asked the County Commissioners for a franchise to extend its lines to East Point.

Jonesboro, Ga.—The South Atlantic Contracting & Construction Company, Jonesboro, has received a franchise from the Council for an electric railway along the main street of Jonesboro for the use of the Atlanta & Macon Railway. [E. R. J., June 8, '12.]

Belleville, Ill.—The East St. Louis & Suburban Railway has asked the Council for a twenty-year extension of its franchise in Belleville.

Galesburg, Ill.—The Galesburg Railway & Light Company has asked the Supervisors for a franchise to extend its line from the present terminus at the corporate limits of Galesburg to the county line.

Lewistown, Ill.—The Illinois Central Electric Railway, Canton, has received a forty-nine-year franchise in Lewistown.

Mansfield, Mass.—E. Schervell, Mansfield, has asked the Board of Trustees for a franchise in Mansfield. This is part of a plan to build an electric railway to connect Mansfield, East Mansfield and Easton.

North Attleboro, Mass.—The Interstate Consolidated Street Railway, North Attleboro, will ask the Board of Trustees for a franchise to double-track its line on Washington Street, North Attleboro.

Worcester, Mass.—The officials of the Worcester & Providence Street Railway have asked the Massachusetts Railroad Commission for an extension of time in which to build its proposed line. The company secured a right several years ago to build a line between Worcester and Providence, holding franchises from Massachusetts and Rhode Island. It has been unable to secure funds with which to build. The president, Fred C. Hinds, and the treasurer, Charles H. Wilson, are seeking the extension of time, pending a hoped-for arrangement to finance the enterprise.

Atlantic City, N. J.—Mayor Bacharach has approved an ordinance permitting the Venice Park Electric Railway to extend its line through the West Side.

Newark, N. J.—The Public Service Railway has received a fifty-year franchise to cross the Clay Street bridge over the Passaic River.

Oswego, N. Y.—The Syracuse, Lake Shore & Northern Railroad, Syracuse, has received a franchise from the Common Council to build a side track to the proposed terminal site in East First Street and to extend its tracks on East First Street between Bridge and Oneida Streets in Oswego.

Columbus, Ohio.—The Columbus Railway & Light Company will ask the Council for a franchise to double-track its Oak Street line between North Street and Washington Avenue in Columbus.

Washington, Pa.—The Washington Traction Company has received a franchise from the Council in Washington.

***El Paso, Tex.**—The County Commissioners have granted to T. M. Wingo, trustee for the interurban electric railway to Ysleta, a fifty-year franchise for the construction of the line from El Paso to a point a quarter of a mile west of the business center of Ysleta and to points in the Rio Grande Valley. Bonus and right of way have been secured and the Stone & Webster Corporation will build the line immediately.

***Texas City, Tex.**—The City Commission has granted a right-of-way and franchise in Texas City to H. B. Moore, W. T. Armstrong, R. M. Orth and Harvey A. Thomas.

Waco, Tex.—R. B. Stichter, representing the Southern Traction Company, has asked the City Commissioners for a franchise in Waco and for permission to have the bridge that will be built by this company across the Brazos located between the present steel bridge and the suspension bridge. [E. R. J., June 22, '12.]

Tacoma, Wash.—The Tacoma Railway & Power Company will extend the tracks of its Pacific Avenue line in Tacoma as far as Fern Hill.

TRACK AND ROADWAY.

Fresno (Cal.) Traction Company.—Work has been begun by this company on the extension of its Olive Avenue line from the North Park line to the cemetery.

Pacific Electric Railway, Los Angeles, Cal.—This company will build a direct line to connect Orange and Santa Ana.

Petaluma & Coast Railway, Petaluma, Cal.—It is reported that S. E. Adams has been awarded the contract to build this 6-mile railway from Liberty Station north of Petaluma into Two Rock Valley. J. E. Alexander, San Francisco, is interested. [E. R. J., April 6, '12.]

Crescent City Railway, Riverside, Cal.—Right-of-way has been secured and work will soon be begun by this company on its extension from Bloomington to Rialto.

United Railroads, San Francisco, Cal.—This company has placed in operation its new Ninth Avenue line in San Francisco.

Big Four Electric Railway, Tulare, Cal.—Construction has been begun by this company on the first section of its line between Tulare and Woodville. S. A. McCoy, Visalia, chief engineer. [E. R. J., June 22, '12.]

Chicago, Ottawa & Peoria Railway, Ottawa, Ill.—The voters of Ottawa by a vote of 1012 to 342 have approved a proposition to allow this company's line to cross the Illinois River on the municipal bridge.

Gary & Interurban Railway, Gary, Ind.—This company has awarded the contract for surveying its line between Gary, Indiana Harbor and East Chicago to F. W. Richey, of the Co-operative Construction Company.

Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.—Arrangements are being made by this company to extend its line through from Greensburg, Rushville or Connersville, Ind., to Cincinnati, Ohio.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—This company has placed in operation the extension of its East Michigan Street line in Indianapolis.

***Portland, Ind.**—An electric railway is planned between Portland and Marion, via Montpelier and Fiatt. Among those interested are D. E. Bims and A. E. Townsend, Cleveland, and C. L. Smith, Montpelier.

Cedar Rapids & Iowa City Railway & Light Company, Cedar Rapids, Ia.—The contract for grading for this line has been let to M. Ford, Cedar Rapids, and steel and crossing material contracts have been awarded to the Loraine Steel Company and the Pennsylvania Steel Company.

***Hutchinson, Kan.**—A company has been organized to build an electric railway from Newton north through Canton, Goessel and Roxbury, through the same territory in which the Hutchinson & Northern Interurban promoters expect to build. The company plans to use motor cars for passenger travel and steam for freight service. T. H. McManus and Dr. Axtell, Newton, are interested.

Kentucky Central Electric Railway, Frankfort, Ky.—Surveys will be begun in July for this 167-mile electric railway from Louisville to Buffalo, Ky., with a branch to Lincoln Farm and Glasgow. From Glasgow another branch will extend to the Mammoth Cave and one to Nashville, via Scottsville. The Indianapolis Construction Company has the contract to organize, finance, construct and equip this line. W. A. Calhoun, Buffalo, has the contract for engineering work and has completed his commercial report. Construction will not be begun before the spring of 1913. J. M. Richardson, Glasgow, president. [E. R. J., June 8, '12.]

***Louisville, Ky.**—The Cane Run Improvement Club, composed of residents of a suburb of Louisville, is interested in the construction of a line from Louisville to West Point, Ky., and from the end of the Pleasure Ridge Park line of the Louisville & Interurban Railroad to the end of the Seventh Street line of the Louisville Railway. The latter companies have not indicated that they are interested in the plan as yet.

Louisville & Interurban Railway, Louisville, Ky.—The construction of a line through Shelbyville, Ky., by this company will be arranged for in the immediate future. The company and the municipality have a plan which will likely be agreed upon that will provide for the purchase of a franchise in Shelbyville for $10,000 and the payment of $500 a year for the maintenance of the streets through which the line passes. Some changes in the tracks already laid down are also to be made. If the agreement is ratified by all concerned, the Shelbyville line will be extended from the limits of the city through Main Street to the other end of the community.

New Orleans, Railway & Light Company, New Orleans, La.—The City Council of New Orleans has adopted a resolution instructing the commissioner of public works of the city to notify the New Orleans Railway & Light Company to realign all of its crossings on Canal street between Claiborne avenue and the cemeteries.

Springfield (Mass.) Street Railway.—This company will construct its East Springfield line as soon as the Council grants the franchise.

***Woodbridge, Mass.**—John W. Wetzel, S. H. Street and associates plan to build an electric railway between Woodbridge, Westville and Seymour.

Gulfport & Mississippi Coast Traction Company, Gulfport, Miss.—This company has been asked to consider plans to extend its lines into Bay St. Louis and on to New Orleans.

St. Louis, Lakewood & Grant Park Railway, St. Louis, Mo.—This company is extending its line to Fenton, via Sunset Inn, a distance of about 9 2-5 miles.

Springfield (Mo.) Traction Company.—About $250,000 will be spent by this company to rebuild and improve its lines in Springfield.

Bethany (Neb.) Traction Company.—This company has awarded contracts for work to begin at once on its 2-mile electric railway between Bethany, University Place and Lincoln. The company will operate four cars. It will purchase power from the Lincoln Traction Company, which will also carry out its car repair work. Capital stock authorized, $25,000; capital stock issued, $20,000. Officers: C. W. Jester, president; J. O. Rowland, vice-president; J. Z. Briscoe, secretary, and H. E. Cutter, treasurer, all of Bethany. [E. R. J., June 1, '12.]

Omaha & Council Bluffs Street Railway, Omaha, Neb.—Extensions of the Fortieth and Cumming-West Farnam Street line and the North Twenty-fourth Street line from Fort Street to Miller Park will be constructed in the near future by this company if the city will pave the streets.

St. John (N. B.) Railway.—Construction will be begun at once by this company on the extension from Haymarket Square along the Westmoreland and Red Head Roads.

Jersey Central Traction Company, Keyport, N. J.—Right-of-way has been secured by this company for its proposed line between Red Bank and Elkwood Park.

United Traction Company, Albany, N. Y.—This company will extend its Mill Street line over Mill Street bridge and along Campbell's Highway to Thomas Street.

Long Island Railroad, New York, N. Y.—This company has awarded the contract to W. H. Gahagan, Brooklyn, for the reconstruction of about 6000 ft. of the Manhattan Beach division of this railway in East New York. The work will include a four-tube tunnel about 3500 ft. long and an embankment from Granite Street to the Brooklyn Borough line.

Black River Traction Company, Watertown, N. Y.—This company will double-track its State Street line in Watertown at once.

Piedmont Traction Company, Charlotte, N. C.—This company has been asked to extend its railway to High Point.

Grand Forks (N. D.) Street Railway.—Plans are being considered by this company to build an electric railway in Bemidji, Minn.

Columbus (Ohio) Railway & Light Company.—This company plans to extend its line on West Mound Street to Greenlawn cemetery. Under these plans the company will have a double track, instead of a single track, as at present, and the Ohio Electric Railway will build a track for its exclusive use.

Dayton (Ohio) Street Railway.—A bonus of $15,000 is being raised by the citizens of Fort McKinley to insure the extension of this railway through Fort McKinley.

***McConnelsville, Ohio.**—The McConnelsville Board of Trade is considering plans to build an electric railway between McConnelsville and Crooksville, connecting with the Southeastern line to Zanesville. E. P. Lawlor is interested.

Toronto & Eastern Railway, Toronto, Ont.—This company, which plans to build an electric railway between Oshawa, Lindsay, Bowmanville, Port Hope and Cobourg, has arranged to build a line from Port Hope to Peterborough, skirting the western point of Rice Lake. R. H. Rothray, Toronto, superintendent. [E. R. J., Dec. 10, '12.]

Dunnville, Wellandport & Beamsville Electric Railway, Wellandport, Ont.—The Ontario Legislature has extended the time within which this company may build its line from Dunnville to Beamsville, Ont., and has authorized it to use any form of motive power. [E. R. J., Aug. 7, '12.]

Oregon Coast Railway, Astoria, Ore.—Surveys are being made by this company for its line between Astoria and Seaside. E. Z. Ferguson, president. [E. R. J., Jan. 29, '12.]

***Klamath Falls, Ore.**—George C. Clark, Everett, Wash., and associates are considering plans to build a 26-mile electric railway from Klamath Falls to Bonanza.

Portland, Eugene & Eastern Railway, Portland, Ore.—Surveys have been completed by this company between Salem and Silverton and it is said that construction will be begun at once.

***Mansfield, Pa.**—Right-of-way is being secured for the construction of an electric railway from Mansfield to Canal Dover, via Millersburg, Holmes County. W. D. Todd and James W. Wiggins, Warren, Pa., are interested.

Saskatoon, Sask.—The Council of Saskatoon, Sask., has closed a contract with the Stone & Webster Engineering Corporation, Boston, Mass., for financing the proposed municipal electric railway in Saskatoon for a year. [E. R. J., June 15, '12.]

Greenville (S. C.) Traction Company.—Work has been begun by this company on the extension of its East North Street line from the present terminus, at the intersection of Boyce Avenue, Greenville, to the suburban residential site beyond Richland Creek.

Memphis (Tenn.) Street Railway.—Work has been begun by this company on the extension of the Buntyn line to Normal.

Nashville-Gallatin Interurban Railway, Nashville, Tenn.—Plans are being considered for the construction of an extension from Gallatin, Tenn., to Bowling Green, Ky., by this company, which is now completing its line to Gallatin. Edward Albright, Gallatin, is handling the extension plans. The extension will run by way of Franklin, Ky.

Houston-Northern Railway, Houston, Tex.—Preliminary engineering work will soon be begun on this 242-mile electric railway between Houston and Texarkana. The Indianapolis Construction Company has the contract to organize and construct the line and has arranged with H. U. Wallace & Company, Chicago, to handle the entire engineering work of this project. It is expected to have construction arrangements made by the spring of 1913, after all the preliminary engineering work is done. Officers: John Lovejoy, Houston, president; K. F. Purdy, Houston, vice-president, and Alex. F. Purdy, Houston, secretary and treasurer. [E. R. J., June 15, '12.]

***San Antonio, Tex.**—F. S. Pearson and William Aubrey plan to build an electric railway between San Antonio and the towns west of San Antonio.

Greenville & Whitewright Northern Traction Company, Whitewright, Tex.—This company is grading its line from Whitewright to Greenville, via Anna, Westminster and Blue Ridge. A. R. Nicholson, Greenville, is interested. [E. R. J., Feb. 24, '12.]

***Bremond & Wootan Wells Interurban Railway, Wootan Wells, Tex.**—The entire right-of-way has been secured to build this electric railway between Bremond and Wootan Wells. M. D. Watson, Wootan Wells, is interested.

Monongahela Traction Company, Fairmont, W. Va.—Work has been begun on the Weston extension of this company's line. The line has been completed from Clarksburg to Mount Clare, and an 18-mile section remains to be built. S. L. Watson, president. [E. R. J., March 30, '12.]

Wheeling (W. Va.) Traction Company.—This company is double-tracking its line through Glendale.

Eastern Wisconsin Railway & Light Company, Fond du Lac, Wis.—This company offers to extend its tracks through the west side district of Fond du Lac, provided the city will secure the necessary releases from property owners.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—This company placed in operation on June 15 its extension into Kenosha.

Badger Railway & Light Company, Milwaukee, Wis.—Arrangements are being made by this company to secure a right-of-way and franchise in Lake Geneva. The line will connect Whitewater, Lake Geneva, Elkhorn and Watertown. H. B. Kamschutte, Milwaukee, president. [E. R. J., April 20, '12.]

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—A site has been chosen by this company in San Bernardino on which the company expects to build its new carhouse. It is stated that the parcel of land which has been secured contains 7½ acres. It is situated west of the tracks of the Southern Pacific Company below First Street.

Indianapolis, Crawfordsville & Danville Traction Company, Crawfordsville, Ind.—The carhouses and paint shop of this company will be abandoned and the buildings dismantled. The machinery and other property are being moved to Lebanon, where all repair work will be done by the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute.

Winnipeg (Man.) Electric Railway.—Construction has been begun by this company of a new building on Notre Dame Avenue and Albert Street, Winnipeg. The structure will be ten stories high, 99 ft. x 80 ft. The cost is estimated to be nearly $600,000.

Detroit (Mich.) United Railways.—Plans are being made by this company to begin at once the construction of the first of four buildings on Woodward Avenue. The structure will be 208 ft. x 289 ft. and will be of reinforced concrete. With the completion of the other buildings the company proposes to move the machine and repair shops to the Woodward Avenue site from its present quarters at Monroe Avenue.

Helena Railway & Light Company, Helena, Mont.—This company plans to construct a new carhouse and machine shop in Helena. [E. R. J., May 25, '12.]

Oakwood Street Railway, Dayton, Ohio.—Work has been begun by this company on the construction of its new carhouses, repair shops and offices on Brown Street, Dayton. The structure will be 400 ft. x 200 ft. The building will contain a planing mill, dry kiln, cabinet shop, blacksmith shop, electrician's shop, paint shop, stock rooms, drafting rooms and superintendent's office. It will be protected by automatic sprinklers.

Portland Railway, Light & Power Company, Portland, Ore.—Construction will be begun at once by this company on its new carhouse at East Twenty-eighth Street, between Burnside and Couch Streets, Portland. The old carhouses on this site have been razed and the erection of the new structure, 185 ft. x 74 ft., will be begun. [E. R. J., May 18, '12.]

Montgomery County Rapid Transit Company, Norristown, Pa.—It is reported that this company will award contracts for the construction of a new carhouse and repair shop in Norristown.

POWER HOUSES AND SUBSTATIONS

Louisville (Ky.) Railway.—This company has let a contract for the installation of two large freight elevators in its new power house at Nineteenth and High Streets, Louisville, to the Abell Elevator Company, Louisville. The contract for the superstructure of the plant, which consists of two buildings, will be let in the near future. It will have heavy concrete foundations, brick curtain walls and a steel frame. The floors will be of reinforced concrete.

Bangor Railway & Electric Company, Bangor, Maine.—This company has completed and placed in operation its new substation at Park and Center Streets, Bangor, replacing the structure destroyed by fire on April 30, 1911.

Jersey Central Traction Company, Keyport, N. J.—During the next four weeks this company will award contracts to build a new steel truss bridge at Morgan, N. J., over the tracks of the New York & Long Branch Railroad.

Republic Railway & Light Company, Youngstown, Ohio.—Work has been begun by this company on its new power house in Youngstown. [E. R. J., May 18, '12.]

Pittsburgh (Pa.) Railways.—This company has remodeled the old power house in Penn Avenue, near Thirty-fourth Street, in Pittsburgh. This structure will now be used as a storage house.

Wisconsin Traction, Light, Heat & Power Company, Appleton, Wis.—This company will increase the station output of its power house in Appleton by the installation of additional equipment in the near future.

Manufactures and Supplies

ROLLING STOCK

New Orleans Railway & Light Company, New Orleans, La., is in the market for a work crane.

Grand Rapids (Mich.) Railway has ordered ten 42-ft. 8-in. closed cars from the Cincinnati Car Company.

Capital Traction Company, Washington, D. C., has ordered five 30-ft. 8-in. pay-within suburban cars from the Cincinnati Car Company.

Chattanooga Railway & Light Company, Chattanooga, Tenn., has ordered ten 28-ft. 8-in. pay-as-you-enter cars from the Cincinnati Car Company.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., has ordered six cars mounted on Brill 22 special trucks from the American Car Company.

New York (N. Y.) Railways has issued specifications for 150 stepless cars. The experimental car of this type which the company now has in operation was described in the Electric Railway Journal of March 16 and March 30, 1912.

TRADE NOTES

National Hygienic Floor Company, St. Louis, Mo., has moved its office to 805 Carleton Building, St. Louis.

Taylor Electric Truck Company, Troy, N. Y., has moved its Chicago office from 1139 to 1137 First National Bank Building, Chicago.

Busch-Sulzer Brothers-Diesel Engine Company, St. Louis, Mo., has appointed George F. Murphy its Eastern sales representative, to succeed W. R. Havnie. The Eastern sales office of the company will be at 30 Church Street, New York, as heretofore.

J. E. Chisholm, Chicago, Ill., has opened an office at 355 Old Colony Building, Chicago, and will handle railway specialties. Mr. Chisholm has been sales manager of the Chicago Steel Car Company for the past three years, and was formerly mechanical superintendent of the Chicago Great Western Railroad.

United States Electric Signal Company, West Newton, Mass., has recently equipped single-track portions of the through route of the Connecticut Company from New Haven to Waterbury, and from New Haven to Bridgeport, with its type K-2 signal. The United States signal is now the standard of the Connecticut Company.

International Pay-As-You-Enter Tramcar, Ltd., New York, N. Y., announces that the first pay-as-you-enter cars ever operated in Europe have been placed in service on the lines of the Gateshead & District Tramways Company, Gateshead, England, a subsidiary of the British Electric Traction Company. The tramway company distributed a folder containing notes and advice to passengers using the pay-as-you-enter cars. Another folder containing special rules and instructions was issued to conductors and motormen in charge of pay-as-you-enter cars.

Standard Underground Cable Company, Pittsburgh, Pa., has appointed William H. Marsh secretary, assistant treasurer and sales manager of the Standard Underground Cable Company of Canada, Ltd., with headquarters at Hamilton, Ont. Mr. Marsh has been superintendent of construction of the Standard Underground Cable Company for the past ten years. H. G. Burd, who has been connected with the Standard Underground Cable Company for some time as sales engineer in the New York office, has been appointed assistant to the sales manager of the Standard Underground Cable Company of Canada, Ltd., with headquarters at Hamilton, Ont.

Vulcan Engineering Sales Company, Chicago, Ill., which has recently taken over the sales and product of the Q M S Company, Mumford Molding Machine Company and the Hanna Engineering Works, announces that J. T. Georgeson has become connected with the company. Mr. Georgeson was formerly with the machinery department of J. T. Ryerson & Son, Chicago. He will have charge of the sales of the Q M S Company products especially and will also follow new lines of devices which the Vulcan Engineering Sales Company expects very shortly to control, including punches, shears, air compressors, etc., and other tools necessary to equip structural shops, boiler shops and foundries.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has received orders for railway equipment from the following companies: City Railway, Los Angeles, Cal., fifty-four double equipments of No. 306-L motors and HL control; Tarentum, Brackenridge & Butler Street Railway, Tarentum, Pa., two double equipments of No. 323 A motors and E-52-A control; Fox & Illinois Union Railway, Aurora, Ill., two quadruple equipments of No. 306 motors and HL control; Chicago (Ill.) City Railway, 125 double equipments of No. 306-CF motors and K-36-G control; Cincinnati Car Company, Cincinnati, Ohio, for the Tyler Traction Company, four quadruple equipments of No. 306 motors and HL control and one quadruple equipment of No. 303-A motors and HL control; Tractional Company, 100 double equipments of No. 306-CA motors and HB control.

ADVERTISING LITERATURE

Trolley Supply Company, Dayton, Ohio, is mailing a folder descriptive of the Peerless Jr. headlight.

Hess-Bright Manufacturing Company, Philadelphia, Pa., has issued several data sheets on H-B ball bearings and their correct use.

Joyce-Cridland Company, Dayton, Ohio, has issued general Catalog B, which describes and illustrates its complete line of lifting jacks.

General Railway Signal Company, Rochester, N. Y., is mailing Catalog Section J, Part 1, which contains complete details of model 4 electric switch engine.

Lord Manufacturing Company, Brooklyn, N. Y., has issued a circular which calls attention to the numerous advantages of the Spencer air cleaner for air compressors and blowers.

Kerr Turbine Company, Wellsville, N. Y., has issued Catalog No. 25, which describes the construction, uses and advantages of small Kerr turbines for driving generators, centrifugal pumps, fans and other high-speed machinery, and for belt drive. The catalog contains numerous data and illustrations.

Russell Car & Snow Plow Company, Ridgway, Pa., has issued a 24-page catalog which describes and illustrates several types of its snow plows for heavy interurban service and combination cars with steel nose plows attached. Attention is also called to its long-broom snow sweepers and cars other than passenger cars.

National Tube Company, Pittsburgh, Pa., has issued a 40-page catalog, "The Modern Boiler Tube." It contains a brief historical sketch of steel boiler tubes and illustrates their efficiency by standard mill tests. In addition it contains a summary of the proceedings at the International Master Boiler Makers' Association conventions, 1909, 1910 and 1911.

NEW PUBLICATION

Electrical Injuries. By Charles A. Lauffer, M. D. 77 pages. John Wiley & Sons, New York and London. Cloth. Price, 50 cents.

This work is a strictly practical treatment of the causation, prevention and treatment of electrical injuries. It covers the symptoms of "flashed" eyes and skin, describes the treatment and gives formulas for healing washes for application to the injured parts. In connection with electrical contact injuries occurs a technical discussion from both the electrical and the physiological side of the effect of the flow of electric current through the human body, including theories accounting for observed results. Rules for breaking contact of a victim with the conductor are given, together with a full discussion of the subject of resuscitation. The author favors the "prone pressure" method of inducing artificial respiration, similar to that advocated by the N. E. L. A. committee on this subject. An illustration showing the positions for victim and operator recommended by the author is inserted. The book concludes with a list of questions covering the information contained in the text. The work as a whole is written in a most concise and distinctly interesting style.

ELECTRIC RAILWAY JOURNAL

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McGRAW PUBLISHING COMPANY

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Vol. XXXIX

JUNE 22, 1912

No. 25

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Alphabetical Index and Classified Directory fourth page following reading

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"JOE," said the General Manager to his master mechanic, "take these gentlemen out in the shop and show them an armature of one of those New Model Westinghouse Motors our cars are equipped with. They are in the market for some new equipments and want to examine the construction of the armatures which, I've been telling them, have given us such great service."

"Well, boss," answered Joe, "you've got me now. We haven't had one of those armatures on the floor for months, although we have about 1600 of them working on the street. If you want to see a motor taken apart we'll have to call in one of the cars."

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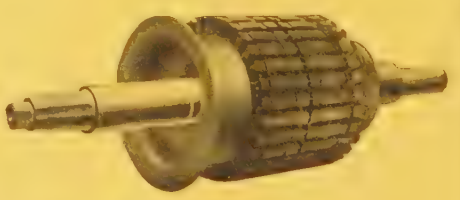
Armature.

Spider.



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Westinghouse Electric & Manufacturing Co.

Sales offices in 45 American cities.

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There are 24 Westinghouse Roney Mechanical Stokers in this one plant. Three were installed in 1889; three, 1896; six, 1897; two, 1898; four, 1907, and eight in 1910.

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Pittsburgh, Westinghouse Bldg.
Cleveland, Swetland Bldg.
Chicago, 39 South La Salle St.
Philadelphia, North American Bldg.
Cincinnati, 1103 Traction Bldg.
San Francisco, Hunt, Mirk & Co.
Denver, 1062 Gas & Electric Bldg.
Mexico, Compania Ingeniera, Importadora y Contratista, S. A. (successors to G. & O. Braniff & Co.), City of Mexico.

M-20

Electric Railway Journal Talks

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That does not prove, however, that the same undertakings would not make *more* money, make it quicker and easier, *with* good advertising.

But it isn't

the big, progressive, aggressive concerns who question the value of advertising as a sales factor. It is usually the none-too-successful House of Don't. In the House of Do they are always willing to spend a dollar to make other dollars. And judging from the cheerful sounds from the latter House they are getting those other dollars—not, of course, solely because the House of Do advertises, but for that reason among others, and because the well advertised house is likely to be progressive and successful in all directions.

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Makes it possible to align ear perfectly with trolley wire and at same time permits ear boss to be tightened securely against hanger bottom.

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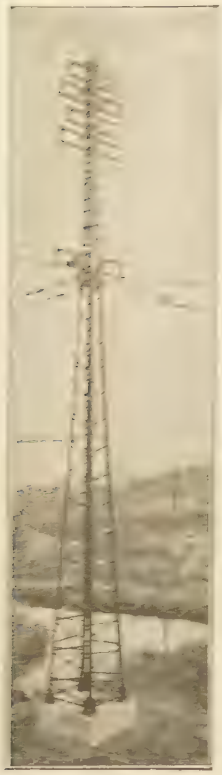

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By controlling this forward movement of the controller it assures proper controller operation at all times. Your motors accelerate properly and at the most economical rate; you get longer life from the controllers; motor troubles are greatly reduced; gears and pinions wear longer; the entire car equipment is relieved of sudden and severe strains which occur when proper controller operation is not effected; the claim department feels the good effects of the Automotoneer, for it is a great factor in reducing "jerky-start" accidents.

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Producers and Mfrs.—not Scalpers

FIR CROSS ARMS
manufactured from
The Best Douglas Fir Timber in the World
DOTY LUMBER & SHINGLE COMPANY
Doty, Washington

DIMENSION
BRIDGE TIES
SWITCH TIES
RAIL CROSS TIES ROAD
LUMBER
Yellow Pine and Cypress
TIES
G. S. Baxter & Co.
17 William Street, New York,
Jacksonville, Florida.

TREATED
POLES, CROSS ARMS, TIES, TIMBERS, PAVING BLOCKS
CAPACITY 100,000,000 FEET B.M. PER ANNUM
SEND FOR PAMPHLET
INTERNATIONAL CREOSOTING & CONSTRUCTION CO.
Address all communications to Office, Galveston, Texas.
Works: Beaumont, Texas. Texarkana, Texas.

Idaho and Coast Cedar Poles
We carry the largest stocks in the Northwest.
Can give you quick delivery at fair prices.
NATIONAL POLE COMPANY
IDAHO CEDAR
1003 Old National Bank Bldg., Spokane, Wash.
COAST CEDAR
1005 Hewitt Ave., EVERETT, WASH.

Washington Fir Cross Arms, Tools and Pole Line Hardware
We carry an enormous stock of this class of material.
We want your orders.
UNION ELECTRIC CO., - Pittsburgh, Penna.

DIVIDE THE COST
When you put in new trolley poles get the electric light company, the merchants or the city to help you pay for them. Do this by getting
Combination Trolley and Light Poles
Even if your company owns the lighting franchise, too, it will pay you to put in these Combination poles. Our Combination pole does the work of two ordinary ones—and the cost is only a little more than for a single iron trolley pole.
Bulletin No. 24 on request.
ELECTRIC RAILWAY EQUIPMENT CO.
CINCINNATI, - OHIO
N. Y. OFFICE, 90 WEST ST.

TRIPARTITE STEEL POLES
Practical, Permanent
Overhead Construction
FRANKLIN STEEL COMPANY, Franklin, Penn.

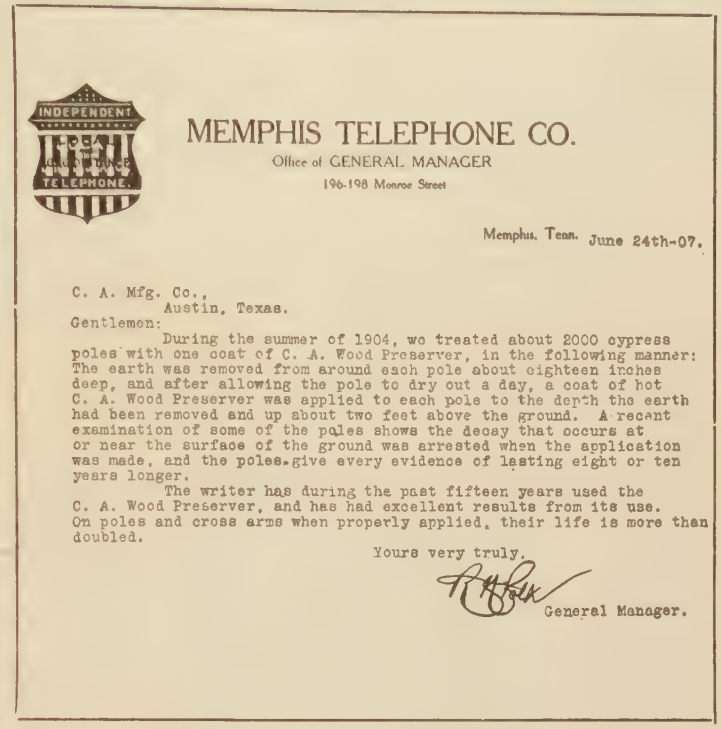
POLES
NORTHERN AND WESTERN
PILING TIES
LONG POLES A SPECIALTY
B. J. CARNEY & CO.
E. B. BRANDE, Manager
Grinnell, Iowa, 810 Broad St.
M. P. FLANNERY, Manager
Spokane, Wash., 606 Paulson Bldg.

NAUGLE POLE & TIE CO.
5 SO. WABASH AVE.
CHICAGO ILL.
The Trinity in Poles
"Service"-"Price"-"Quality"
POLES

DO YOUR POLES DECAY?
Then reinforce them with the
ORR REINFORCEMENT
You double their life at two-thirds the cost of setting new poles. Write for Booklet.
PITTSBURGH REINFORCING POLE CO.
435 6th Avenue Pittsburgh, Pa.

You Can Save Ninety Dollars a Mile or More In Maintenance of Your Poles Now Standing

Method of Applying "C-A-Wood-Preserver" to standing poles



MEMPHIS TELEPHONE CO.
Office of GENERAL MANAGER
196-198 Monroe Street

Memphis, Tenn. June 24th-07.

C. A. Mfg. Co.,
Austin, Texas.
Gentlemen:

During the summer of 1904, we treated about 2000 cypress poles with one coat of C. A. Wood Preserver, in the following manner: The earth was removed from around each pole about eighteen inches deep, and after allowing the pole to dry out a day, a coat of hot C. A. Wood Preserver was applied to each pole to the depth the earth had been removed and up about two feet above the ground. A recent examination of some of the poles shows the decay that occurs at or near the surface of the ground was arrested when the application was made, and the poles give every evidence of lasting eight or ten years longer.

The writer has during the past fifteen years used the C. A. Wood Preserver, and has had excellent results from its use. On poles and cross arms when properly applied, their life is more than doubled.

Yours very truly,

General Manager.

Here is one piece of proof—others on request

As almost every observer knows, trolley poles and other timbers used for like purposes are attacked by rot at and below the wind and water line, where moisture is most persistently in contact with the pole.

It is a very simple matter, as the illustration and letter show, to get at this portion of the pole.

If you have poles standing which are beginning to show signs of decay you can stop the rotting and prolong the life of poles indefinitely by a single application of

"C-A-WOOD-PRESERVER"

as shown and described in the illustration and letter.

The entire process, including all labor and material, will not cost you at the very most more than

THIRTY CENTS PER POLE

As a matter of fact that is probably an excessive figure. It is much more apt to be nearer twenty cents per pole than thirty.

Accepting the figure of thirty cents, however, and figuring only thirty poles to a mile of track at a valuation of only $3.00 per pole, you would be spending only

NINE DOLLARS PER MILE TO SAVE NINETY

And the user of "C-A-Wood-Preserver" in this manner will at least *double* the life of your poles.

If you are interested in such savings of maintenance charges we shall be glad to give you further information—and proof if you want it.

C-A-Wood-Preserver Co.

ST. LOUIS, MO.

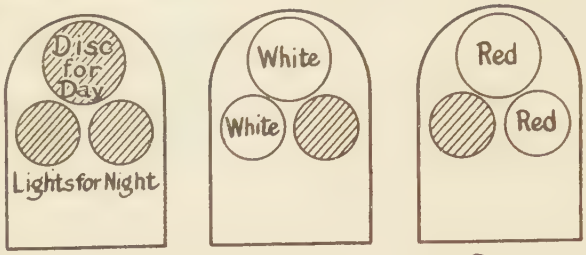
TRADE MARK C-A WOOD PRESERVER REGISTERED U.S. PATENT OFFICE

CHICAGO AUSTIN, TEXAS NEW YORK INDIANAPOLIS NEW ORLEANS
SALT LAKE CITY—Western Elec. Co. DENVER—Western Elec. Co.

Western Electric Company, Pacific Coast Selling Agents

SAN FRANCISCO LOS ANGELES PORTLAND SEATTLE

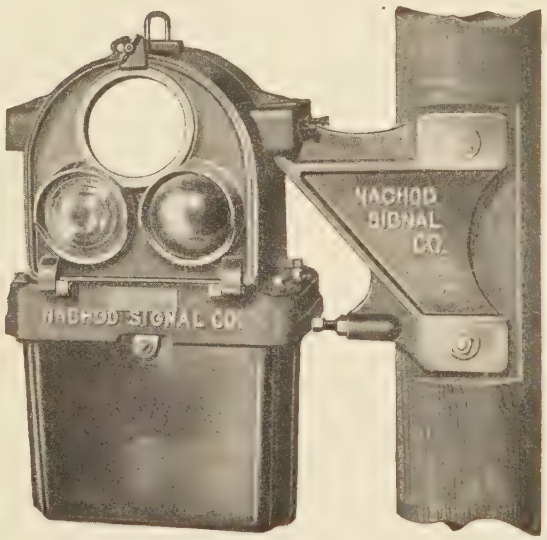
TRADE MARK C-A WOOD PRESERVER REGISTERED U.S. PATENT OFFICE



Neutral Proceed Stop

With momentary return to neutral as affirmatory permissive indication for following cars.

Distinct Indications



Unmistakable day and night indications on Nachod Signals leave no room for guesswork on the part of the motorman. He sees the condition of the block ahead as he approaches it.

He sees that the signal has protected his car before proceeding in the block.

He gets these indications regardless of weather conditions and with the least possible care on the part of your maintenance forces.

Installations of Nachod Signals have been operating for a whole year with less than $5.00 worth of maintenance.

The story of how "Nachod Spells Safety" and at the lowest cost will be mailed on request. Write for it.

Nachod Signal Co.

214 South 12th St. Philadelphia, Pa.

Despatchers' Telephone Circuit Controls the Station Lights

By pressing a button, the despatcher can light or extinguish all stations along the line individually or collectively by simply pressing a button.

The Sandwich

Remote Control Station Lighting System

is revolutionizing present methods by making this control possible. It costs only a trifle for switches to install this system, and maintenance cost is practically nil. No interference with the ordinary uses of the line.

There's a tremendous current, lamp and labor saving in this for you.

Tell us to explain in detail.

Sandwich Electric Co.

Sandwich Illinois

SYSTEMS EGRY REGISTER COMPANY DAYTON, O.

EGRY DESPATCHER

is used by the majority of electric roads because it gives an undeniable protected record which cannot be altered. It eliminates guess work in car movements by establishing certainty.

Write for booklet—now—before the summer rushes

BLAKE DISPATCHER'S SIGNALS

Write for descriptive pamphlets. For telephone dispatching.

BLAKE TUBE FLUX

For soldering. Write for sample.

BLAKE SIGNAL AND MANUFACTURING CO.

246 Summer St., Boston, Mass.

Dependable High Speed Signals

Exclusively for Electric Lines

The Automatic Signal & Appliance Company

Cleveland, Ohio

GEO. P. NICHOLS & BRO.

OLD COLONY BUILDING CHICAGO, ILL.

DESIGNERS AND BUILDERS OF

Electric Transfer Tables

Our transfer tables are used on nearly every important steam railroad system in this country and on many electric railroads. We can furnish these in either the surface or the pit types, and to meet all requirements.

U. S. AUTOMATIC ELECTRIC SIGNALS

Account for These Facts

Fact 1

The largest three electric railway systems in the world are equipped with U. S. Automatic Signals and use no other automatic signals.

Fact 2

More electric railway systems use U. S. Automatic Signals than all other signal systems combined.

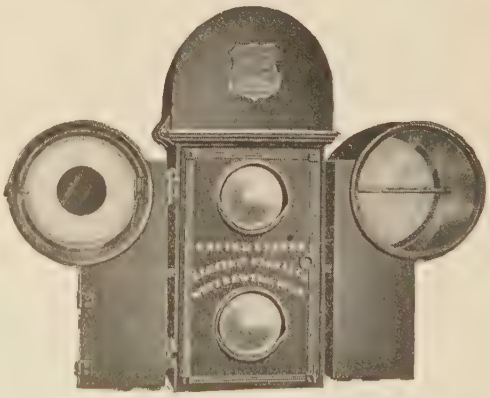
Fact 3

We've never heard of a collision on a road equipped with U. S. Signals. They've been used over 15 years.

The Only Explanation

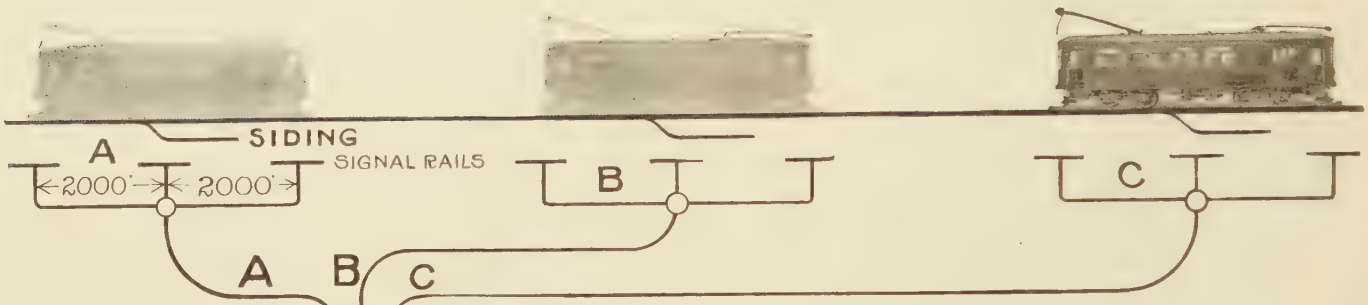
that will account for all these facts is based on the absolute protection provided by U. S. Automatic Signals under all conditions.

There is a type exactly suited to your service. Tell us to explain it to you.



United States Electric Signal Co.
West Newton, Mass.

The Dispatcher Has a Every Train on Positive Cab



Every Car Movement Is Instantly Recorded

The SIMMEN Railway

The Simmen System is without question the most remarkable system of railway signaling ever devised. And its very simplicity is one of its most astonishing features.

Its operation on the Toronto & York Radial Railway (electric), in Canada, has proven it wonderfully successful.

It has established an efficiency of 99.995%, having failed on an average only once in 20,000 indications. One of the virtues of the system is the fact that if any part becomes deranged or inoperative, the signal displayed is always "danger" or "stop."

The system provides for an automatic record of train movements in the dispatcher's office in graphic form, interlocked control switches on the dispatcher's desk by means of which he can signal "stop" or "proceed" indications to engineer or motorman direct in his cab and, if desired, direct telephone communication can be had between cab and dispatcher's office.

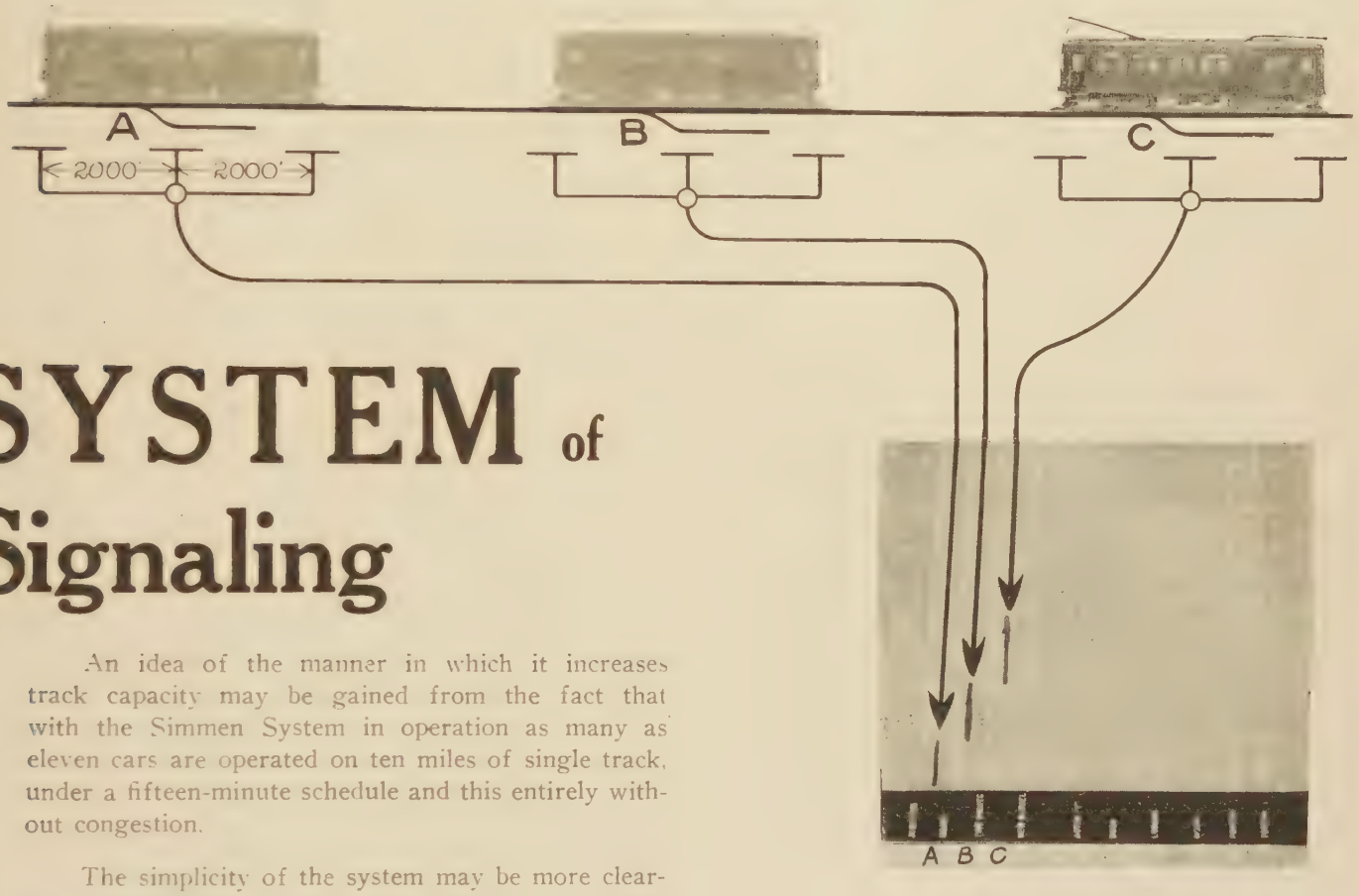
The system facilitates quicker and more frequent train movements, with absolute safety. The dispatcher can change a meeting or passing point instantly without the least risk, simply by changing the interlocking control switches in his office. In this way, in case of delay to one train, opposing trains will not waste time waiting for a "meet" and extra trains and other unexpected train movements, may be directed with as great facility as the movements of regular trains.

NORTHEY-

Sole Licensees in the U. S.

INDIANAPOLIS, IND.

"Moving Picture" of His Road With Signal Control



As the Car Proceeds this Record is Made

SYSTEM of Signaling

An idea of the manner in which it increases track capacity may be gained from the fact that with the Simmen System in operation as many as eleven cars are operated on ten miles of single track, under a fifteen-minute schedule and this entirely without congestion.

The simplicity of the system may be more clearly understood when it is explained that 90 per cent. of the apparatus used is stock equipment. Line wire and short contact rail sections at intervals are the only parts of the system installed along the roadway. All apparatus is installed in the dispatcher's office and in the cab.

The automatic record in the dispatcher's office gives the dispatcher full knowledge of the whereabouts of all trains and enables him to direct the movements perfectly and, in addition, it serves as a permanent record of the train's movements, speed, maintenance of schedule, etc.

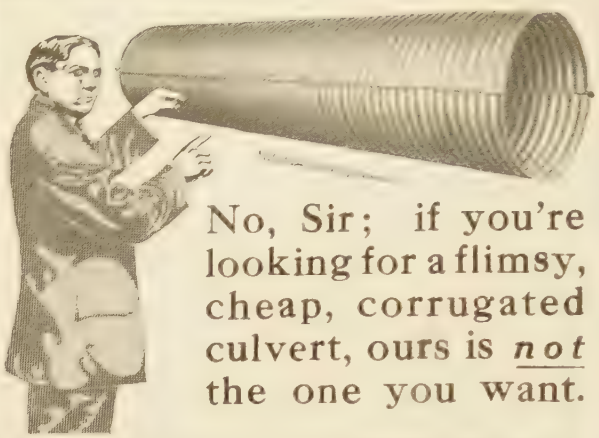
The first cost is far less than that of the automatic block system, and is in direct proportion to the amount of traffic.

It will be greatly to your advantage to learn of the merits and technical operation of the Simmen System. Write for complete description with photographic illustrations and diagrams. Mailed on request.

PLUMMER, Ltd.

for the Simmen System

TORONTO, CANADA



No, Sir; if you're looking for a flimsy, cheap, corrugated culvert, ours is *not* the one you want.

But if you want a good, heavy, well-made, anti-corrosive, convenient, lasting and satisfactory culvert, the ACME ENDESTABLE is YOUR culvert.

Don't pass this up lightly. If you're a culvert user at all, get a line on the ACME ENDESTABLE and draw a wise man's conclusions regarding it.

Send for our photo-illustrated booklet M-3 and prices today.

THE CANTON CULVERT CO.
MANUFACTURERS
CANTON, OHIO, U.S.A.

New York Switch & Crossing Co.

Hoboken, N. J.

Engineers, Contractors and Manufacturers of Tee rails, frogs and switches, and girder rail hard center special work Also anti-kicking tongue switches.

CLEVELAND FROG & CROSSING CO.

SPECIAL WORK

of GIRDER and HIGH "T" RAIL

"HARD CENTER" and "BUILT-UP" CONSTRUCTION

PORTER'S PATENT DERAILING SWITCHES

CLEVELAND, O.

TARGET BRAND WEED KILLER

Kills Weeds and Vegetation of all kinds on road beds, and preserves ties at a minimum of cost. Results have proven Target Brand Weed Killer a wonderful money and labor saving proposition.

Give us width of track and number of months that vegetation grows each year, and we will write you fully.

HORTICULTURAL CHEMICAL COMPANY, Bullitt Bldg., PHILA., PA.

U. S. Metal & Mfg. Co.

165 Broadway, New York City
McCormick Bldg., Chicago

RAILWAY SUPPLIES

Selling Agents for

Dunham Hopper Door Device—Flexible Drop Brake Staff Columbia Lock Nut—"Diamond" Steel Pole—Anglo-American Varnishes and Shop Cleaner—Cunningham Steel Axles—Empire Pressed Steel Truck Bolster—"Texoderm."

Sole Eastern Agents for St. Louis Surfacer & Paint Co.
General Eastern Agents for Hutchins Car Roofing Co.
Special Agents for The Tool Steel Gear & Pinion Co.

T Rails and Nelsonville Filler and Stretcher Brick

offer all the advantage without the disadvantages of the groove rail. Construction approved by city engineers.

Write for Booklet.

The Nelsonville Brick Co., Nelsonville, Ohio

ORIGINAL VULCANIZED FIBRE

In Sheets, Tubes, Rods, and Special Shapes for Electrical Insulation and General Mechanical Uses.

Noiseless Gears, Handles, Insulating Parts for Controllers, Overhead Crossings, Etc.

SEND FOR CATALOGUE AND SAMPLES

AMERICAN VULCANIZED FIBRE CO., : : : Wilmington, Del.

Kilby Frog & Switch Co.

Birmingham, Ala.

TONGUE SWITCHES,
MATES,
FROGS,
CURVES,
and SPECIAL WORK of all kinds for
STREET RAILWAYS

Established 1882

The Weir Frog Co.

Manganese Track Work

Cincinnati, O.

Steel Wire Frog and Switch
BROOMS

for cleaning dirt, snow or ice from the frogs and curves of street railway tracks.
Sold with or without chisel-shaped points attached to handle. Write for prices.

J. W. PAXSON CO.
Philadelphia, Pa.

Round Square Flat
MAGNET WIRE
ALL INSULATIONS
STANDARD UNDERGROUND CABLE CO.
BOSTON NEW YORK PHILADELPHIA — **PITTSBURGH, PA.** — CHICAGO ST. LOUIS SAN FRANCISCO
For Canada, Standard Underground Cable Co. of Canada, Ltd., Hamilton, Ont.

Gears and Pinions — Special Track Work
Cast Welded Joints — Open Hearth Steel Castings
THE FALK COMPANY
MILWAUKEE, WIS.

Crown. United States.
Twin Terminal.
Soldered. Soldered Stud.

WE ARE extensive manufacturers of all kinds of stud terminal and soldered rail bonds. Nothing but pure drawn copper enter into their construction. These bonds have been developed to the highest possible state of perfection, the workmanship is of the best, and their design is correct for long life and high efficiency. We also make a complete line of tools for installing rail bonds. Catalogue fully illustrating rail bonds sent on application.

We Make

American Wire Rope	Barbed Wire
Aeroplane Wire and Strand	Woven Wire Fencing
Piano Wire	Fence Gates
Mattress Wire	Steel Fence Posts
Weaving Wire	Concrete Reinforcement
Broom Wire	Springs
Fence Wire	Sulphate of Iron
Flat Wire	Poultry Netting
Flat Cold Rolled Steel	Wire Rods
Wire Hoops	Juniata Horse Shoes and Calks
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Rail Bonds	Wire of Every Description
Bale Ties, Tacks, Nails, Staples, Spikes	

American Steel & Wire Co.'s Sales Offices

CHICAGO, 72 West Adams Street. NEW YORK, 30 Church Street. WORCESTER, 24 Grove Street. BOSTON, 120 Franklin Street. PITTS- [illegible] CLEVELAND, Union Trust Building. CLEVELAND, Western Reserve Bldg. DETROIT, Ford Building. ST. LOUIS, Third Nat'l Bank Bldg. CINCINNATI, Bank of Commerce Bldg. MINNEAPOLIS, Plymouth Bldg. DENVER, Ernest & Cranmer Bldg. SALT LAKE CITY, 726 South 3rd West Street.

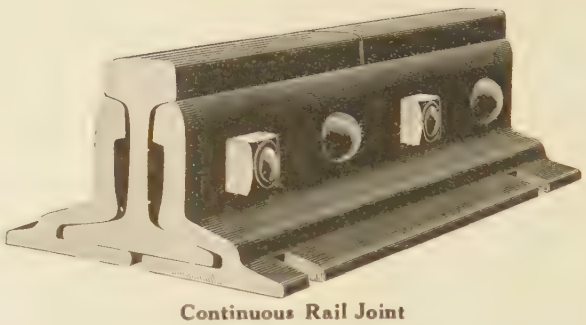
United States Steel Products Company

Export Department: New York, 30 Church Street.
Pacific Coast Department: San Francisco, Rialto Building. Portland, Ninth and Alder Sts. Seattle, 4th Ave. South & Yesler Way. Los Angeles, Jackson & Central Ave.

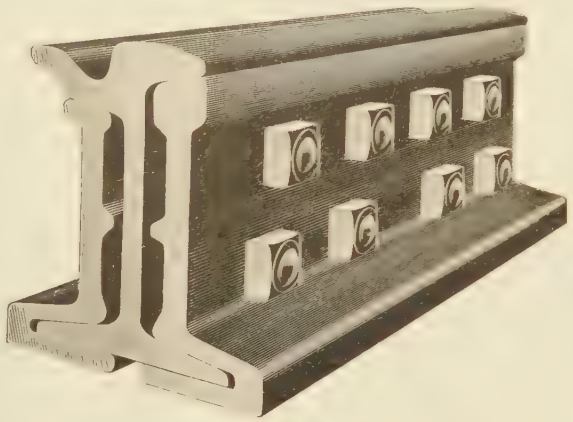
Over 50,000 Miles Of Track Equipped

Or enough Continuous, Weber and Wolhaupter base supported Rail Joints to girdle the globe with a double-track railway, is practical proof of the value of The Rail Joint Company's product.

Highest Awards: Paris, 1900; Buffalo, 1901, St. Louis, 1904



Continuous Rail Joint



Continuous Girder Joint

Makers of Base Supported Rail Joints for Standard and Special Rail Sections, also Girder, Step or Compromise, Frog or Switch, and Insulating Rail Joints, protected by Patents.

Catalog at Agencies

Chicago, Ill. Pittsburg, Pa. Boston, Mass. Portland, Oregon
St. Louis, Mo. Denver, Colo. New York, N. Y. Troy, N. Y.

London, E. C., England Montreal, Canada

HIGHEST AWARDS—Paris, 1900; Buffalo, 1901; St. Louis, 1904

The Rail Joint Co.

General Offices:

185 Madison Avenue, New York

2

Special Work for Street Railways

Frogs, Crossings, Switches and Mates

Manganese Steel Center Layouts

BARBOUR-STOCKWELL CO.

205 Broadway, Cambridgeport, Mass.

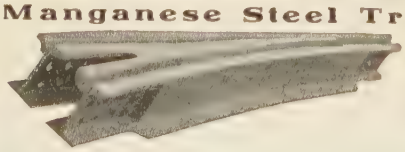
"INDIANAPOLIS" Manganese Track Work

{is a composite of Scientific Designing and the Most Dependable Metal. It has made good. Write us.}

Indianapolis Switch & Frog Co., Springfield, O.

SALES OFFICES:—New York Chicago Kansas City Spokane Portland Seattle Los Angeles San Francisco

Manganese Steel Track Work



FROM THE LARGEST LAYOUT TO THE SMALLEST INSERT

(1)

St. Louis Steel Foundry, 1560 Kienlen, St. Louis, Mo.
Owned and operated by Curtis & Co. Mfg. Co., St. Louis.

The **THEW** Electrically Operated **Shovel**

Has demonstrated its economy, efficiency and adaptability for

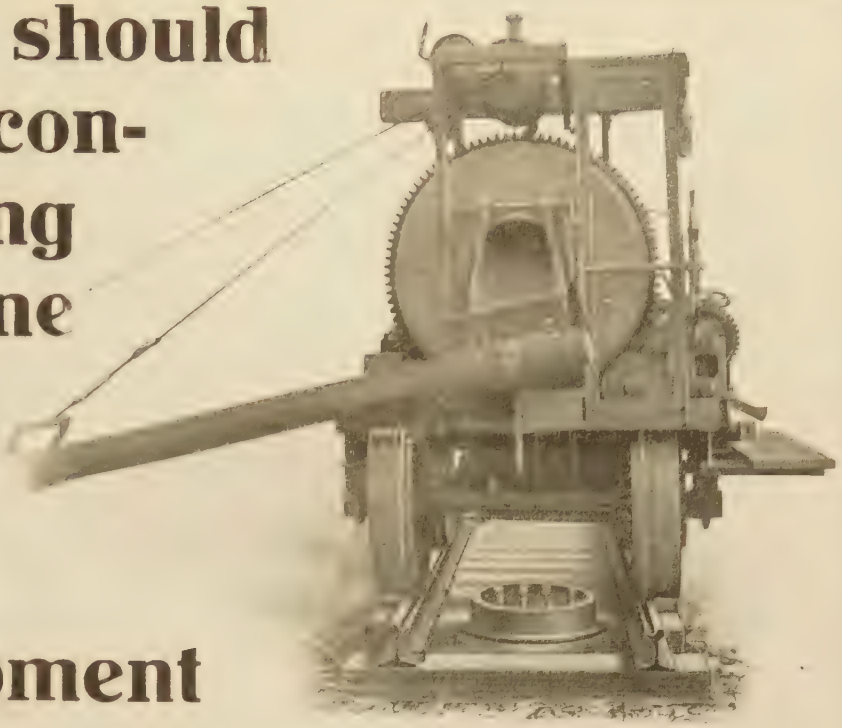
ELECTRIC RAILWAY USE

It will reduce the cost of your rebuilding, new construction, ballasting or general excavation and paving.

Circular J15 tells all about it.

THEW AUTOMATIC SHOVEL CO. LORAIN, O.2

Why you should seriously consider adding this machine to your Maintenance of Way Equipment



CONCRETE is rapidly pushing to the front as the most satisfactory material for both paving and track foundations.

The part that the paving and track foundation plays in street railway maintenance is not always appreciated.

Next to the rails, it is the part of your road that receives the most wear and tear. Unlike the rails, it is subject to most rapid depreciation.

The grinding of trucks and other modern heavy street traffic—**from which your road derives not the slightest returns**—slowly, but none the less surely, ruins paving and track foundations such as crushed stone, cinders, etc.

And impaired track foundations are not only a constant source of expense, but of danger.

CONCRETE is the most durable and economical material yet invented to withstand foundation service.

In answer to the demands of the many electric railways now replacing their old track-fill with **CONCRETE** the **NEW RANSOME (Street Railway Type) CONCRETE MIXER** was evolved.

It is distinctly an electric railway tool.

It eliminates the necessity of employing an outside contractor to do your work.

It is simple enough to be operated by **your own men,** with the most elementary instructions.

It may be self-propelled and operated by electricity, by gasoline or simply operated by either gasoline or electricity and drawn by one of your own cars.

It is fitted with flanged wheels as desired. It is only 11 feet high, has an 18-inch clearance and loads and discharges from front to back.

Furthermore, its swinging concrete chute will cover a semicircular radius of 40 feet.

And your street-paving work finished, this Ransome Mixer will enable your own men to handle your other concrete jobs and repairs along the road, resulting in still more savings.

Write us and we will be glad to take up the subject in detail. Write today

Ransome Concrete Machinery Co.

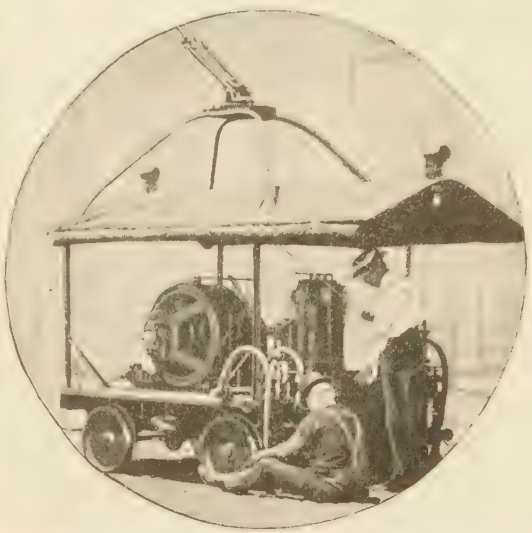
DUNELLEN, N. J.

A Joint Is a Resistance Point

and every bond on your road that depends for conductivity upon a surface to surface contact represents two resistance points.

When vibration opens up these joints sufficiently to admit moisture—corrosion sets in and the trail of damage to your own and other property due to faulty return circuits, begins.

Electric Weld Rail Bonds



eliminate joints and joint resistance by welding the rail and bond into a single piece, offering permanent proof against corrosion and faulty return circuits.

The result is an all-round reduction in maintenance cost and power plant burdens and at a cost below that of any joint system.

Our bonding books contain valuable data on bonding and will be mailed upon request.

The Electric Railway Improvement Co.

6005 Carnegie Avenue Cleveland, Ohio

1

One of the Most Important Requisites

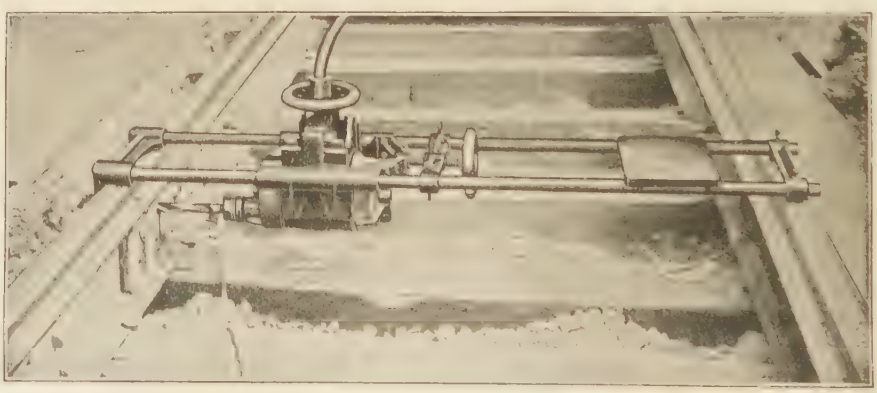
for good bonding is to have ***Round, True, Clean Holes*** in the rails to receive the heads of the bonds. By using the

Duntley Electric Track Drill

for drilling these holes just prior to applying the bonds you can accomplish this result with ***Accuracy and Economy.***

QUICKLY APPLIED.
DRILLS RAPIDLY.
QUICKLY REMOVED.

ORDINARY WORKMEN CAN OPERATE IT.



WRITE FOR BULLETIN E 21 COVERING COMPLETE LINE OF ELECTRIC DRILLS AND GRINDERS FOR ELECTRIC RAILWAYS.

Chicago Pneumatic Tool Co.

CHICAGO
1010 Fisher Bldg.

Branches Everywhere

NEW YORK
50 Church Street

Make New Tracks Out Of Old Ones

Sounds like Aladdin and his wonderful lamp, doesn't it? But to those who are familiar with the everyday results of the Kerwin-Detroit Rail Grinder "on the job" there's nothing strange or improbable about it. You can extend the life of partially worn-out rails from three to six years and make them as smooth as on the day they were laid by the use of the Kerwin-Detroit Rail Grinder.

One road prolonged the life of ½ mile of badly-worn double track four years, the rebuilding of which was estimated to cost $15,000, and actually saved $9,600 in the operation. The Kerwin-Detroit Rail Grinder proved a pretty good "investment" for that road.

Another company reports the saving of $58,906.66 in three years on two miles of track by using the Kerwin-Detroit Rail Grinder. A pretty good dividend saved there! We can tell you of many other roads which have saved equally as much with these machines.

This machine will grind down cups and battered heads, high joints, high abutting rails, and will remove corrugations, leaving a smooth tractive surface. The operation in each case requires but a few minutes and the services of but one man.

The Kerwin-Detroit Rail Grinder is a portable, self-propelled car which operates emery grinders mounted on a sliding carriage. It is entirely automatic in its action.

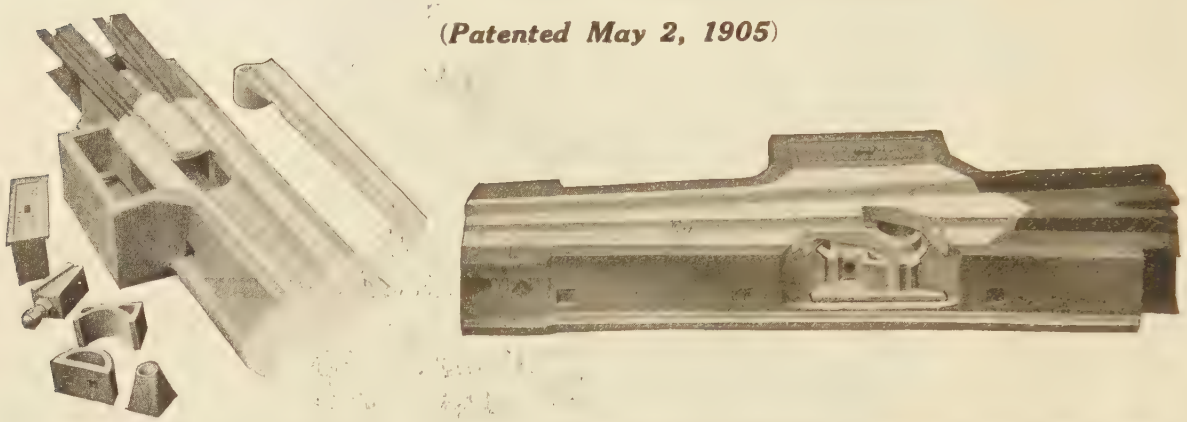
Let Us Tell You How It Can Effect Economies For Your Road

Kerwin Machine Co., Detroit, Mich.

WHARTON-SPECIAL TRACK WORK
OF SUPERIOR DESIGNS
FOR ALL CLASSES OF SERVICE

The Wharton Heel-less Tongue Switch

(Patented May 2, 1905)

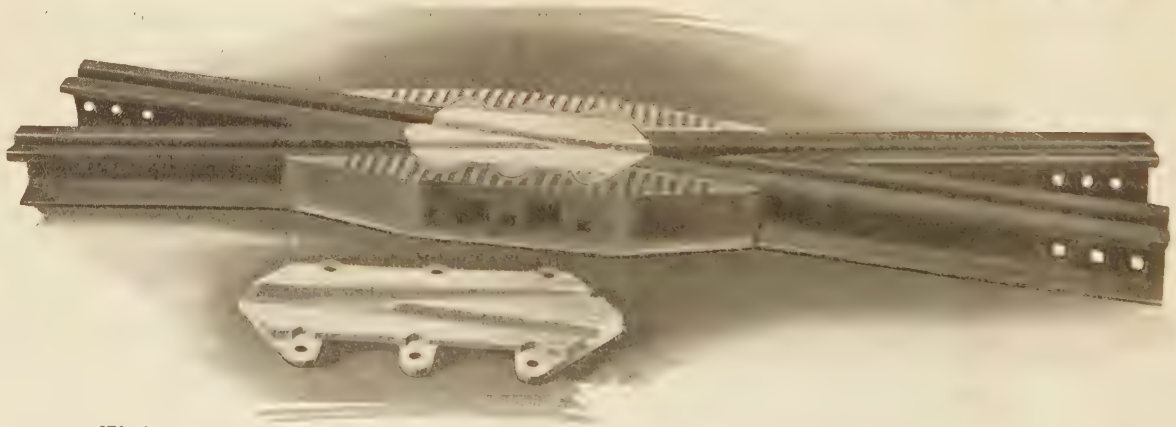


The only Tongue Switch constructed on the correct principle, to prevent knocking down at the butt end, and kicking between trucks. We will be pleased to tell you why. In extensive use since 1904, and adopted as standard by several large railways. Therefore, tried out and found to be unquestionably the best on the market.

MANGANESE STEEL TRACK WORK IS OUR SPECIALTY

WM. WHARTON JR. & CO. INCORPORATED
PHILADELPHIA, PA. JENKINTOWN, PA.

Here's A Frog That Will Solve Your Loose Center Troubles



We fasten the centers in these frogs in such a manner that they positively do not work loose under the severest traffic conditions. This eliminates a great deal of worry and maintenance expense.

The superior excellence of construction and the quality of our MANGANESE TRACK WORK assure long life under the most trying conditions. *We shall be pleased to figure with you on your requirements.*

THE BUDA COMPANY

NEW YORK OFFICE: Hudson Terminal Bldg.

631 Ry. Exchange Building
CHICAGO

WORKS: Harvey, Ills.

Titanium Rails Prove Superior On Lehigh Valley R. R.

Recent competitive test between plain open-hearth steel rails and ferro-titanium steel rails proves Titanium rails 54% more durable.

Conditions of Test

All rails A. S. C. E. Section 90 lbs. per yard.

Plain open-hearth rails laid on 5° 56′ curve.

Titanium open-hearth rails laid on 6° 6′ curve.

All rails in service when measured, 20 months.

Diagrams and data furnished by Rober W. Hunt & Co., New York

Durability in favor of Titanium Rails 54%

Other recent competitive tests between plain open-hearth and Titanium open-hearth have proven superiority of Titanium rails as shown by percentages below:

Tests on Other Roads

Boston & Maine	. . .	40% in favor of Titanium Rails.
Boston Elevated	. . .	41% " " " " "
Baltimore & Ohio	. . .	56% " " " " "

Titanium rails cost only about $2 more per ton than untreated rails. When you order, specify that our men shall look after the Titanium addition. On this condition we will make no charge for their services.

Diagrams of rail tests and valuable technical data if you ask for Booklet No. 22

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Operating Under Rossi Patents — Processes and Products Fully Patented

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THE PRIMOS CHEMICAL CO. Primos, Delaware County Pennsylvania

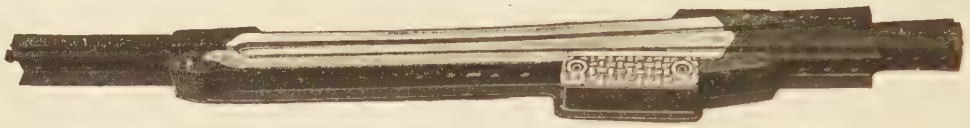
THE

Pennsylvania Steel Company

Frog and Switch Department

STEELTON, PA.

Pinless "MANARD" Switch
Patented



No pin, hence no cavity at heel of tongue to clog with dirt or snow. A "Manard" clamp prevents either vertical or horizontal displacement of tongue. The tongue has a bearing on the same plane throughout its entire length.

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THE J. MILTON HAGY WASTE WORKS Inc.
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For Water Tube and Tubular Boilers
GREEN ENGINEERING CO.
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Automatic Smokeless Furnace
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(a) Brass to iron thread connection—No corrosion.
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(c) 125 pounds compressed air test under water—No defective fittings.
(d) Solid three piece construction—No inserted parts.
(e) Easily disconnected—No force required.
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VALVES—FITTINGS—BENDS
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THE CUTTER ELECTRICAL AND MANUFACTURING CO. CIRCUIT ITE BREAKERS PHILADELPHIA

I. T. E. Circuit Breakers
for heavy street railway work are the best obtainable.
Write for New Complete Catalogue.

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60% of the people within 100 miles radius of a meet will attend—you carry them.
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positively eliminates all scale formation or corrosion in the boiler tubes or on the sheets. It is the only scientifically certain method whereby fuel consumption may be reduced to the minimum, and whereby substantial savings in the power costs of any plant may be obtained.

No matter what the type or size of your boiler may be, DEARBORN TREATMENT of your feed water will give you increased steaming capacity and effect important economies, as we shall be glad to demonstrate to your satisfaction.

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THE ADVANTAGE

of the butt joint used exclusively in Crocker-Wheeler power transformers is that the lines of magnetic force follow the direction of the magnetic circuit. Its units are free from eddy currents and magnetic forces tending to make the laminations vibrate or hum.

Send for our Bulletin 154-P.

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Deming Electric Driven Triplex Power Pumps

For High or Low Pressure.
Elevated Tank Service.

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Insure uniform superheat at temperature specified.

Power Specialty Company

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has established itself as a part of the equipment of electric railways—as necessary a part as lightning arresters, and railway operators are coming more and more to recognize the fact.

They are putting Pyrene Extinguishers in the power house and substations to cope with heavy arcs caused by short circuit.

They are putting them in the cars to be used on motor, controller and other fires. They are putting them in the shops for extinguishing fires in highly inflammable material because

Pyrene

is the only extinguisher efficient on fires in gasoline, ether, paint-removers, lacquers and on other vicious fires.

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The Interboro Rapid Transit Company now has more than 5500 Pyrene extinguishers on its system and the fact that it is constantly ordering recharges attests to the fact that Pyrene is being used frequently.

We will be glad to furnish you with a list of roads using Pyrene.

Pyrene Mfg. Co.

1358 Broadway NEW YORK

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Write for our Electrical Booklet describing what these roads are doing with Pyrene

As an Aid to Standardization Nothing Can Approach the

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In So Far As the Electric Car and Its Equipment Is Concerned

A copy of this valuable work should be in the hands of the officials (and their principal assistants) in charge of the executive, treasury, auditing, legal, operating, mechanical, purchasing and claim departments of every electric railway, as well as every manufacturer, branch office manager, salesman or dealer in car equipment.

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ELECTRIC RAILWAY JOURNAL 239 WEST 39th STREET NEW YORK CITY

The Difference Between Oil and Lubrication

is a difference of at least 10% in cost.

This is not theory. A Galena contract provides for the saving, which is made possible by

Galena Oils and Galena Expert Service

Galena oils themselves would effect savings, but in using them according to the Galena Method, as shown by our experts, we are enabled to guarantee that the cost per thousand miles and per thousand kilowatt hours will be a definite amount less than during the preceding year.

Galena service offers economies in other directions as well.

Are you familiar with the details of the Galena guaranteed saving contract? Let us explain it to you.

Galena-Signal Oil Company

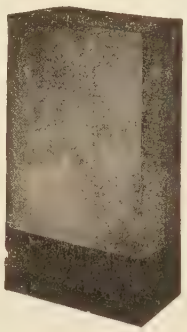
Franklin, Pa.

It isn't the cost per brush—it's the cost per year of brush service that figures in favor of Le Carbone

Le Carbone brushes have a high first cost but figured by the year are the cheapest ones you can afford to buy. Le Carbone Brushes reduce brush bills and armature room expenses.

W. J. Jeandron

173 Fulton St. New York



A sample in your hand is the most convincing selling argument ever presented.

Better than a "list of prominent users" are the actual tests we want you to make—tests which will convince you that

Stackpole Carbon Brushes

are self-lubricating, have maximum flexibility, minimum voltage drop, highest current density, lowest specific resistance, lowest coefficient of friction, eliminate sparking and are absolutely noiseless. All standard grades and sizes for every requirement. Tested by us before shipment. Uniform in quality. Write for further particulars.

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STACKPOLE CARBON CO., ST. MARYS, PA.

Largest Independent Carbon Plant In U. S. Ask us for Samples

BRANCH

New York, N. Y., 32 and 34 Frankfort St.

A BRUSH WITHOUT A PEER

NON-CUTTING
NON-SPARKING
NOISELESS

PERMANENTLY
SELF LUBRICATING
CARBON BRUSHES

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Get MORGANITE "built-to-order" BRUSHES on your Generators and Rotary Converters

We say "built-to-order" because Morganite Brushes are installed in accordance with the conditions which have to be met. Every grade is designed for a particular service. You will find your commutator troubles fading away with the installation of Morganite Brushes.

No Brush Friction.
No sparking.

A reduction in brush cost and wear of commutator and a minimum voltage drop in the brush. All these qualities and more. Write us for a trial set on approval and see.

The Morgan Crucible Company, Ltd.

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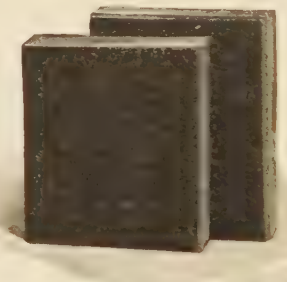

Over 31,000 Miles With Less Than 3 16 Inch Brush Wear

The larger Laclede Brush is the size of those fitted on a Westinghouse 121 motor with slotted commutator.

The smaller brush was one of the set, taken off the car after operating 31,000 *miles* over an interurban line.

The actual wear is shown by the illustration.
It was less than 3/16-inch.
LACLEDE Brushes wear well.

NATIONAL CARBON COMPANY Cleveland

SPEER CARBON BRUSHES

Special grades to meet special needs. Soft frictional surfaces mean better and longer wear.

Scratching, breaking, etc., eliminated.

Send for a sample and make your own tests.

See the Point

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KINNEAR Steel Rolling Doors

FOR CAR HOUSES

Compact, Durable, Easily and Speedily Operated and Fireproof
Openings of any size may be equipped and the doors motor-operated if desired. Manufactured by the

KINNEAR MANUFACTURING CO., Columbus, Ohio

BOSTON PHILADELPHIA CHICAGO

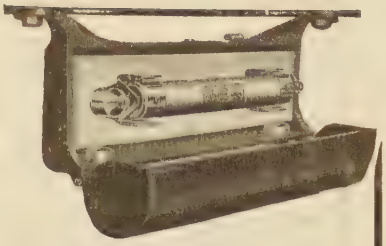
The result of the best practice in electric railway work is recorded in the Electric Railway Journal every week

Protect Your Motors From Overloads

It is cheaper to install a reliable protective device than to have your motors burn out from an excessive overload.

You can positively protect your motors from overloads with "NOARK" Car Fuse Boxes equipped with "NOARK" Fuses.

"NOARK" Boxes are substantially made of iron and the cover has a snap latch, making it easy to replace a blown fuse without tools.



"Noark" Single Pole Car Fuse Box 1-400 Amps. 500 Volts.

"Noark" Single Pole Car Fuse Boxes

cost less to install and maintain than circuit breakers. They cannot "freeze" or allow currents to pass them and injure the insulation, short circuit the controller or produce inductive kicks, as circuit breakers frequently do.

The "NOARK" Fuses, with which they are fitted, will stand the heavy inrush of current on starting of car, but open the circuit silently with "NOARK" or flash if the overload continues beyond a safe limit.

Furnished in several styles (both vestibule and underslung).

Write nearest Branch for Booklet and Prices

"Noark" 600-Volt N.E.C.S.) Car Fuse Box, 100-400 Amperes

H. W. JOHNS-MANVILLE CO.

MANUFACTURERS OF ASBESTOS AND MAGNESIA PRODUCTS

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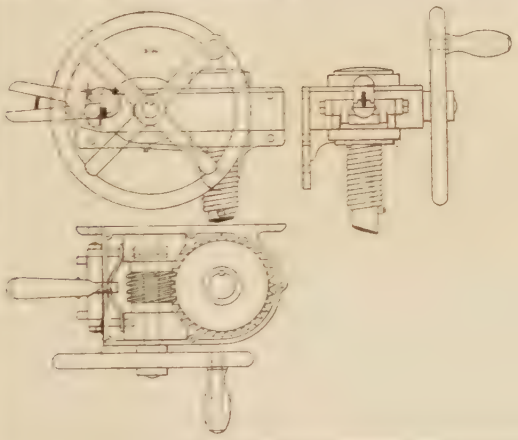

Fresh Worm-Geared Hand Brake Provides Safety

for your equipment and finances by reducing the number of car accidents. It has all the advantages without the ills of power brakes—gives continuous regular power—more room in vestibule—has no dogs or ratchets—grip eccentric gives instant release.

Write for the money saving features of the Fresh *worm-geared* brake.

Car equipped on approval.

HENRY FRESH - - Cumberland, Md.

You have no right

to slam your passengers around like dice in a box every time the car starts. The Con-Tro-La-Tor will stop this trouble and prevent armature and field burnouts, too. Get the bulletin.

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Aerial Transportation

One man with a Triplex Block hung from an overhead trolley can lift any load up to twenty tons and then push the load wherever the trolley goes. Write for the Book of Hoists to-day.

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Makers of Yale Products **9 Murray Street, New York**

More than 15,000 fires have been prevented from spreading, through the action of

GRINNELL AUTOMATIC SPRINKLER

Two-thirds of these were totally extinguished by the sprinklers. The buildings were not flooded—they were wet down only where the incipient fire made this necessary.

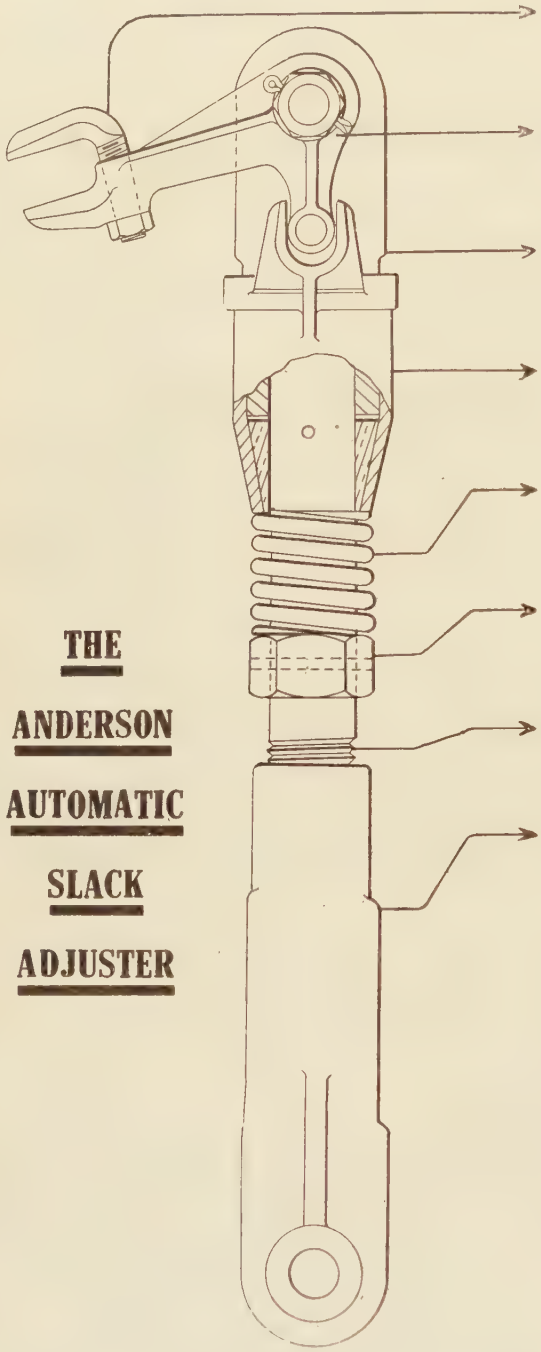
GENERAL FIRE EXTINGUISHER CO.
Executive Offices: Providence, R. I.

Plants, Warehouses and Offices in Principal Cities of United States and Canada

Our latest booklet "Automatic FIRE Protection" shows how all this is done. 40-45

Study This Illustration

and You Will See Why the Anderson Slack Adjuster Always Keeps the Brakes in Perfect Adjustment



THE ANDERSON AUTOMATIC SLACK ADJUSTER

Adjusting finger for regulating slack position of brake shoe.

Rocker arm which rotates the friction clutch.

Forked sleeve connection for live lever.

Friction clutch which turns the brake-adjusting screw.

Clutch spring which holds the clutch in engagement.

Nut for adjustment of slack for new brake shoes.

Brake-adjusting screw connecting dead lever with clutch.

Threaded sleeve holding brake-adjusting screw.

How It Operates

The adjusting finger is set to allow a certain travel of the live lever. When the travel exceeds the predetermined distance, the fulcrum pin engages with the finger and rocks the bell crank which in turn rotates the clutch sleeve, changing its relative position with the inside frictional part (which is secured to the brake-adjusting screw) without changing the position of the screw in the dead lever sleeve. This movement is due to a greater amount of friction between these threaded parts on full application of the brake than between the parts of the friction clutch.

On the releasing stroke of the live lever the fulcrum pin engaging with the bell crank returns the clutch sleeve to its original position and carries with it, the brake-adjusting screw rotating it in the dead lever sleeve. This reverse action is due to the fact that less friction exists between these threaded parts when the brakes are released than between the parts of the friction clutch. By this action the length of the strut between the live and dead levers is increased and excessive slack in the brake rigging is taken up in the same proportions. This adjuster is installed without changing the brake rigging or angularity and ratios of levers.

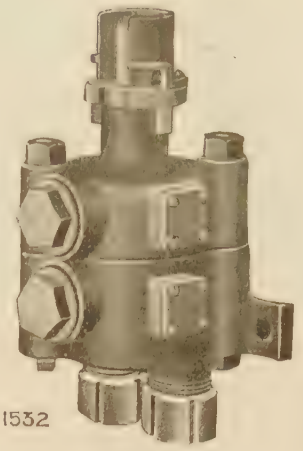
We will tell you of the economies it is effecting in service. Ask us to.

The Anderson Brake Adjuster Co.

OMAHA, NEB.

A Few Turns Of This Wrench On These Nuts

Represents the simple operation which quickly exposes the seat of



National Type ½in. Piston Valve

Made Without Ground Joints

and permits a new seat to be inserted. It's an operation of a few minutes against that of several hours when repairing the seat of a slide or rotary valve. And this operation is required far less often in National piston valves.

The construction of this valve is extremely simple. The admission and release valves have a seat of especially treated leather which effectually prevents wasteful leaks and thus insures perfect braking with a minimum amount of air.

There is no pressure in the valve bonnet except when the brake cylinder is charged, hence no chance for constant leaks around the valve stem, bonnet or seat, as in valves with ground joints.

The only part that requires oiling is the valve stem.

This valve can be installed on your cars without changing the piping or valve bracket.

Your motormen will have no trouble in operating it as the operating positions are the same as those of slide and rotary types.

Give this valve a reasonable try-out on your cars. If it doesn't prove more efficient and economical than your old types, return it.

At any rate, it will pay you to investigate. We have reserved a copy of Bulletin E-88 for you.

It contains interesting information on this and several other types of motorman's valves for straight air brake service. Just tell us where to send it.

Sectional View.

National Brake & Electric Company

Manufacturers of Air Brake Equipments

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NEW YORK : 165 Broadway
CHICAGO : 1545 Railway Exchange
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ST LOUIS: 318 Security Building
LONDON, ENGLAND : 14 Great Smith Street

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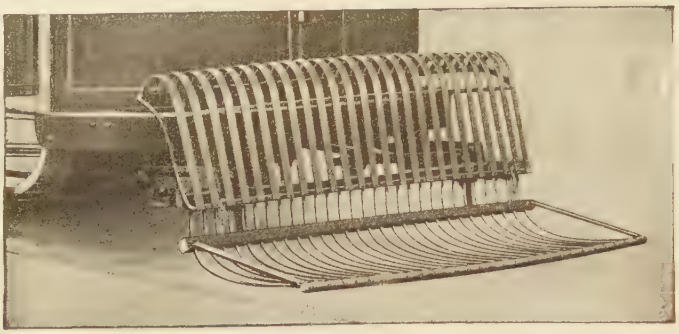


As Necessary As The Power For Your Cars

You have to carry twenty people some distance to receive one dollar. The greater portion of that dollar is swallowed up by legitimate expenses.

Suppose then that an accident occurs because your car does not give adequate protection to pedestrians, and you have to pay for damages, which sometimes run into *thousands* of dollars.

What are the profits?

The elimination of accidents by the use of

"Providence" Fenders and Wheel Guards

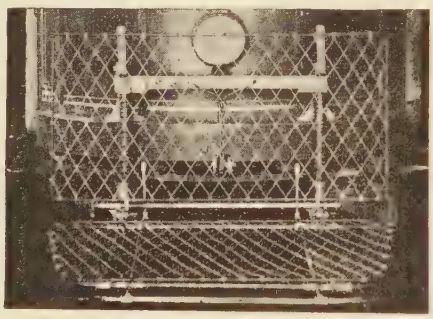
makes them actual dividend payers.

Whether an adult or a child is in danger the "Providence" fender gently picks them up from any position.

Send for detailed information.

The Consolidated Car Fender Company

Manufacturers of The Providence Fender and Wheel Guard
Factory: PROVIDENCE, R. I.
General Sales Agent: Wendell & MacDuffie Co., 165 Broadway, New York



The New "Portland" Automatic Air-Controlled Safety Fender

"PORTLAND" Automatic Air-Controlled Safety Fender

The new "Portland" Automatic Air-Controlled Safety Fender is the last word in street car fender construction.

As now finally perfected, the "Portland" Automatic Safety Fender represents a large expenditure of money and more than four years' systematic work by some of the best street railway operators, mechanics, engineers and safety device experts in the United States.

The "Portland" Fender is declared by competent authorities to be the solution of the street car fender problem.

In compactness, neatness of design, speed and certainty of action in all emergencies, the new "Portland" Fender meets all the requirements of both a projecting fender and a wheel guard. Address:

Western Automatic Fender Co.

SEATTLE - - - WASHINGTON

Every Road That Tries Them Orders More

Parmenter Fenders and Wheel Guards

have become standard on many roads.

For over fourteen years they have given efficient and economical service wherever used.

Parmenter Wheel Guards are attached direct to the truck and protect *both* rails on curves. Our 1911 Model D surpasses all other and insures long life to the guards. Absolutely automatic.

Further information gladly furnished on request.

Parmenter Fender and Wheel Guard Co.
89 State Street, - - Boston, Mass.

The Monarch Refillable Fuse

A Bit of Fuse Wire and a Minute

applied to a Monarch Refillable Fuse, will suffice to eliminate a whole family of old line fuse expenses. Instead of throwing away blown fuses, or spending nearly first-cost refilling them—why not use the

Monarch Refillable Fuse

The cost of refilling is practically nothing. Anyway—send for literature and a free sample.

Ackley Brake & Supply Co., New York City
Sole Sales Agents—to whom all inquiries should be addressed.

To Prevent Dewirement at Crossings

The Automatic Trolley Guard

The smooth under-run of the "Automatic" gives adequate crossing protection—reduces the cost in all departments—eliminates *damages* from dewirement and is proof against corrosion and the elements.

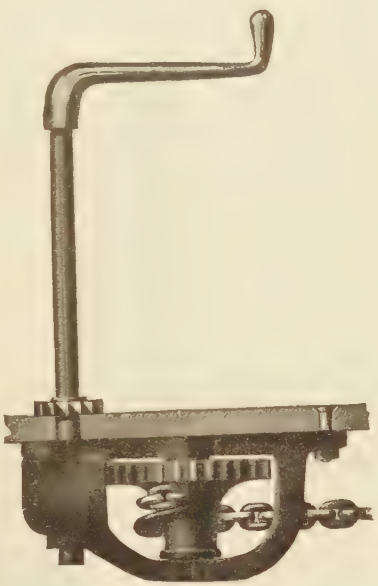
Let us take this matter up in detail with you—address your communication to:

ACKLEY BRAKE & SUPPLY CO.

MANUFACTURERS' AGENTS FOR ACKLEY BRAKES FOR EXPORT ONLY TO ALL COUNTRIES OUTSIDE OF UNITED STATES, CANADA, MEXICO & HAWAII
Sole Sales Agents for the AUTOMATIC TROLLEY GUARD and the MONARCH REFILLABLE FUSE for the entire world.
Manufacturers' Agents for Railway Specialties.

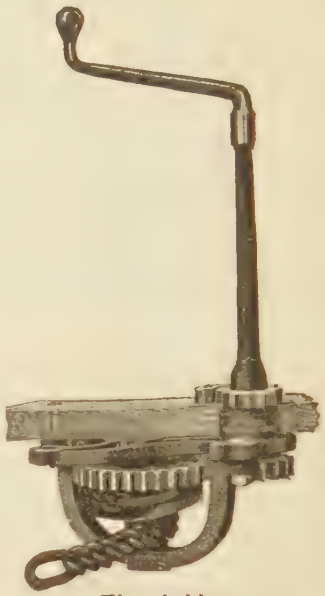
50 CHURCH STREET Cable Address, "Acklebrake New York" Represented all over the world NEW YORK CITY

For the Sake of Safety



The Peacock Brake

—safety to your own and other property—safety to pedestrians and to your passengers install for the hand brake equipment of your cars, the time tried, efficient



The Ackley Adjustable Brake

Peacock & Ackley Adjustable Brakes

Aside from their records of perfect service they will effect marked economies in maintenance.

They also effect savings in dead weight—on one road the change from cheap brakes to Peacock and Ackley showed a saving in dead weight of 400 pounds per car.

An initial installation of Peacock and Ackley Brakes instead of the cheap brakes would have cost very little more. In fact the saving on the installation expense of Peacock and Ackley Brakes would just about offset their extra first cost.

We have compiled some interesting brake statistics which we will gladly mail on request. Let us get together on this important subject.

SOLE MANUFACTURERS FOR UNITED STATES, CANADA, MEXICO, HAWAIIAN ISLANDS

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Eighteen Hundred C P-27 Air Compressors

were ordered from the General Electric Company during the first three months of 1912. A single order for 500 air brake equipments was a direct result of competitive tests.

Besides meeting the most rigid requirements on test, these compressors are producing remarkable results in low maintenance expense and exceptional reliability in service. The exclusively General Electric design, with gear centrally located on crank shaft, results in quiet operation with entire absence of vibration.

The G-E method of lubrication produces a flood of oil over all moving parts whenever the compressor is in operation, and yet requires minimum oil and attention.

These and other valuable features are described and illustrated in Bulletin 4699, furnished on request.

The General Electric Company manufactures all types of air brake equipments for every class of service, including air compressors of the C P-27 type in suitable capacities up to 100 cu. ft. per minute.

General Electric Company

Largest Electrical Manufacturer in the World

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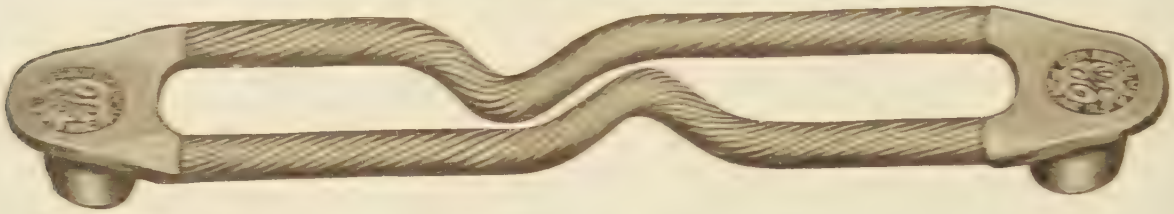
Sales offices in
all large cities.

3555

Form F Railbonds Stand Hard Service



The Reasons:—

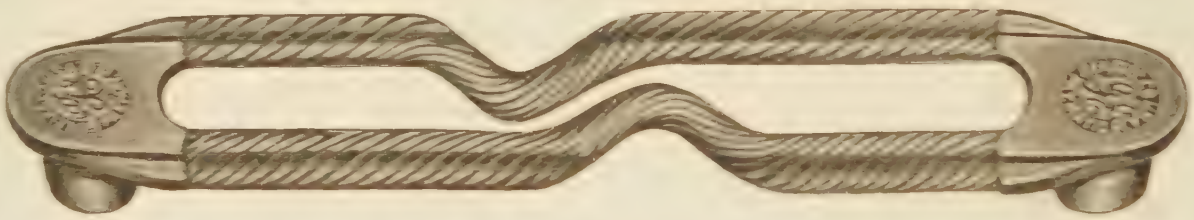
Stranded conductors consist of many small wires, wound, with a very short pitch in the same direction.

In the cable, the size and lay of wires enable the individual strands to take an equal proportion of the maximum vibrations.

Our method of manufacture obviates, entirely, the possibility of brittle studs; at no period, during our special process, is the copper heated to an injurious temperature.

Our patented process ensures, in every bond, a perfect weld between conductor and terminal.

Form F Pressed Bond



Where the space is limited under the splice bar, as in T rails, and a bond is required of maximum cross section, the pressed cable bond is recommended.

The cable is pressed to conform to the space between the rail and the splice bar; a greater working clearance is thus obtained than by unbalancing the stranded conductors.

Cross Section 4/0 Bond on 70 lb. T Rail

General Electric Company

Principal Office Schenectady, N. Y.

3088

Illinois Traction—Standard Distant Signal

Have You Ever Ascertained How Little It Costs To Protect Dangerous Curves With Continuous Track Circuit A. C.

Automatic Block Signals

Electric railway managers and financiers who are deterred from installing continuous track circuit automatic block signals on their roads through the belief that the expense will not be within the financial means of their company owe a duty to themselves and their railway to investigate this subject.

If it is not financially practicable at the outset to protect the entire road, the dangerous curves can be taken care of by automatic block signals, arranged so that they will mesh in with a complete installation ultimately.

For roads not requiring more than 1500 ft. braking distance, light signals may be used instead of semaphores, thereby reducing the cost.

Automatic block signaling is in no sense a luxury but is easily within the means of and a valuable asset to any electric railway.

As a method of promoting safety, improving schedules, increasing track facilities and increasing traffic through inspiring public confidence, continuous track circuit automatic block signals are proving their value on more than 21,000 miles of railway throughout the United States.

You owe it to your own interest to consult us
You will incur no obligation by so doing

The Union Switch & Signal Co.

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This group of instruments embodies the results of the most exhaustive study and scientific investigation of the problems involved in the development of thoroughly durable, reliable and accurate instruments for use on alternating current circuits.

Full particulars of design, construction, prices, etc., are given in Catalog R. J. 16. Write for one

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"Ay, Ay!" Roared the Rest in Chorus. "Kill him! kill him!"

Hotfoot Smith Is Marked for Death!

Could Hotfoot have but pierced the future! Could he only have foreseen the diabolical plot on foot to destroy him!

Little did he reck, when he entered the lists single handed to fight his enemies, of the depths of cunning and infamy to which they would stoop. But let us not anticipate.

When Old Freezemup, arch enemy of Hotfoot Smith, our hero, fled car 101, and was followed shortly after by Out-of-Date-Heater, both routed by Hotfoot, it was with no pleasant feelings.

Always taciturn and solemn by nature, and an enemy of mankind generally, Old Freezemup was now white with rage.

Blustering and storming with pent-up fury, he gathered his minions around him and went into secret conclave, bent on the destruction of Hotfoot Smith.

And what a motley gathering of reprobates! Old fashioned, antiquated, antediluvian car stoves and heaters of many shapes and sizes, and varying claims and pretexts, were assembled at the rendezvous.

After the first excited buzz had subsided, Out-of-Date-Heater rose to his feet and shouted:

"That 'bunk' hero, Hotfoot Smith, is putting us all out of business. I understand now he has received an invitation to be the guest of honor at the Railway Officials' Banquet. There is only one thing to do to him!"

"Ay, ay!" roared the rest in chorus. "Kill him! kill him!"

(Continued next week)

Features of the Peter Smith Forced-Ventilation Hot-Air Car Heater

A guaranteed temperature of 60 degrees, regardless of severity of weather. Insures perfect ventilation, changing air in the car every six minutes. Low operating cost. Standard now on 200 roads in the United States and Canada. Light in weight. Heat circulates upward, insuring warm and dry floors. Uniform distribution of heat. Approved by the board of health in principal cities of the United States and Canada. Easily removed during the "off" months, thereby avoiding seven months' haulage of unnecessary weight. Of fool-proof construction. The Detroit United Railways uses 800 Smith heaters; the Cleveland Railways, 750; the Louisville Railway, 250; the Des Moines City Railway, 105; the Winnipeg Electric Railway, 45, and we can name many more.

Ask for circular and blue prints showing installation

The Peter Smith Heater Co.

88 Isabella Street **DETROIT, MICH.**

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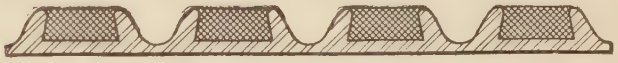

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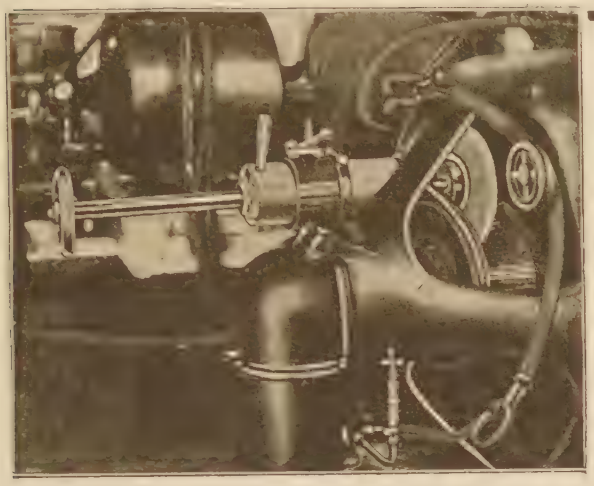

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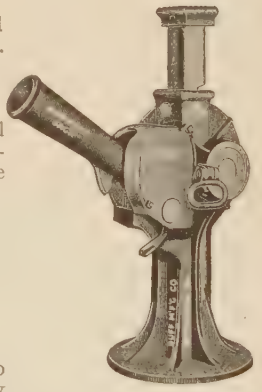

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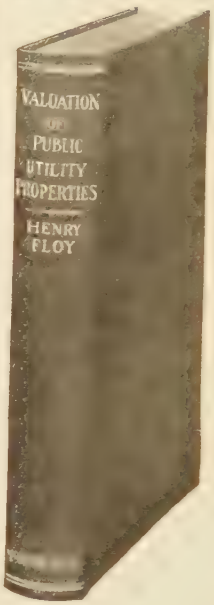

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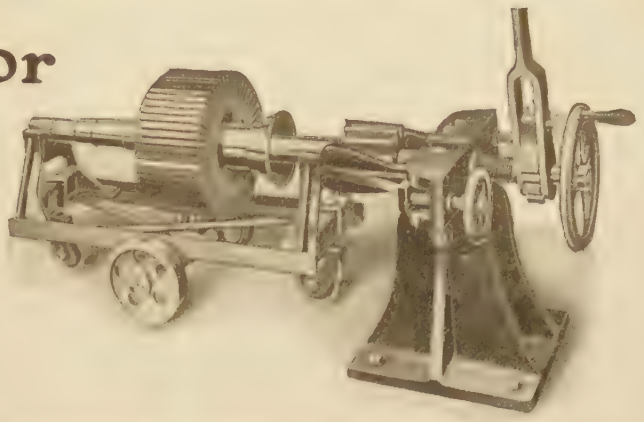

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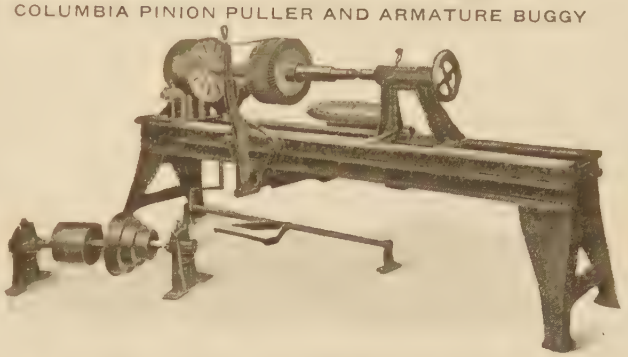

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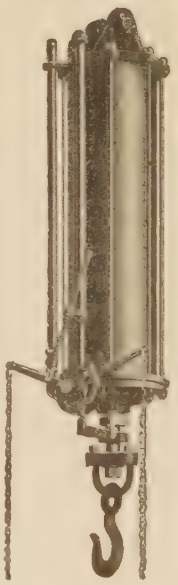

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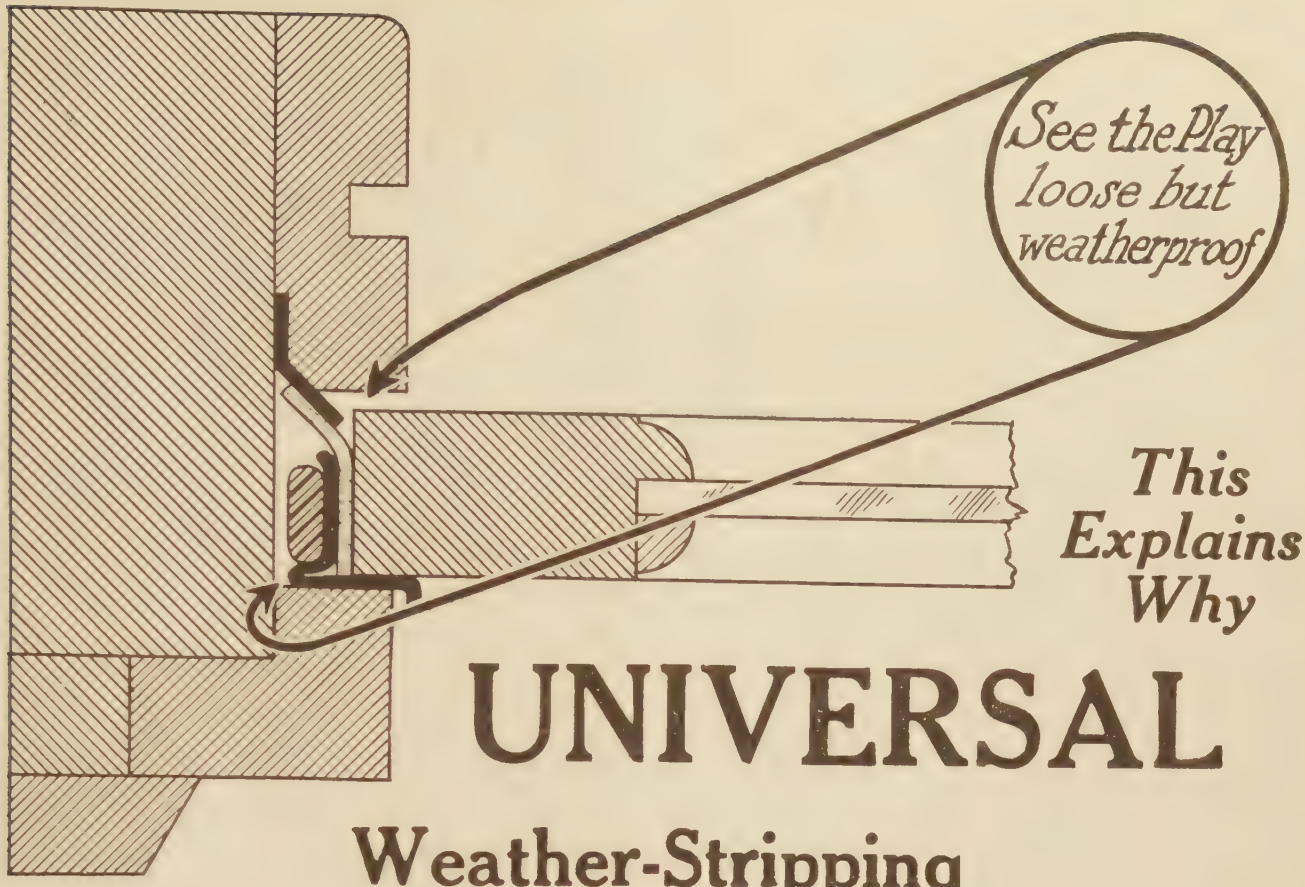

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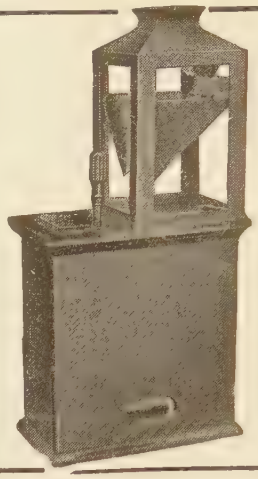

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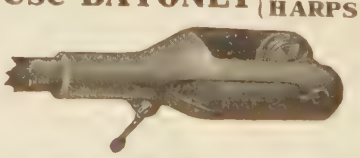

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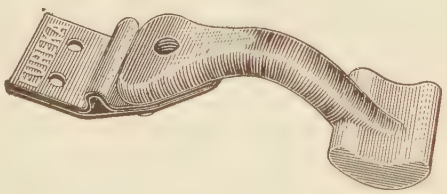


Our springs spring.
Our segments fit.
Try them.
Shipments from stock.

THE EUREKA COMPANY - North East, Pa.

Air Brake Troubles

cease to exist if all parts of the air brake system are lubricated with Dixon's Graphite Air Brake and Triple Valve Lubricants. Best in all climates, under all conditions. Booklet 108-C free.

Joseph Dixon Crucible Company
JERSEY CITY, N. J.

FLUSH OR DRY

DUNER CLOSETS

also Vestibule Folding Door Tracks

DUNER COMPANY, 101 South Clinton Street CHICAGO

SEE THAT CRANK?

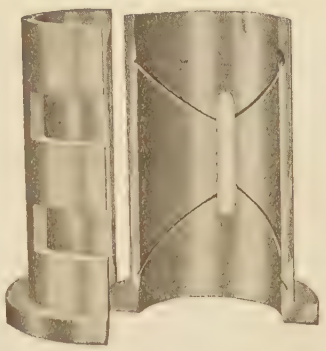
By means of it, conductor or motorman can change sign without leaving platform. All that has to be done is to turn the crank. Better investigate.

CREAGHEAD ENGINEERING CO.
CINCINNATI, O. 1

PISTON HEAD PACKING RINGS

Manufactured by
McQuay-Norris Mfg. Co.
St. Louis, Mo.

Consider the Effect of Axle Bearing Durability on Other Car Equipment



The greatest value of Axle Bearings is of course determined by mileage.

It is upon the basis of mileage service that

More-Jones Axle Bearings

have shown the remarkable results establishing their reputation as the cheapest bearings on the market, when service is considered in proportion to first cost.

There is an additional value

however in the slow-wearing character of More-Jones Axle Bearings which is also of importance. For instance, the wear on an axle bearing gradually throws the gear and pinion out of alignment. If the initial wear on the bearing is comparatively rapid the effect is of course to pull the gear and pinion more quickly out of line and consequently to produce greater (and less even) wear on the gear and pinion teeth.

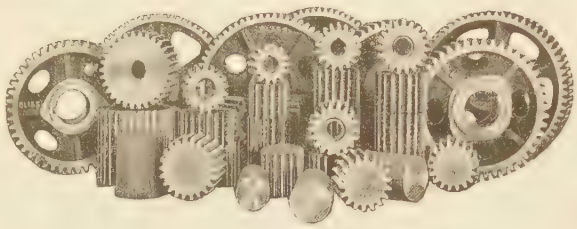
The superior *toughness* and *density of grain* which exists in More-Jones Bearings, and which is produced by our *method of casting*, insures a very slow and very even wear, thus not only giving long mileage but preserving the bearing alignment with consequent advantage to equipment throughout.

More-Jones Brass & Metal Co.

Manufacturers of

Trolley Wheels and Harps, Contact Springs, Motor Axle Bearings, Armature Bearings, Truck Journal Bearings, Air Compressor Bearings, Armature Babbitt Metal and similar products

St. Louis **Missouri**



We guarantee a certain definite mileage for

"Bliss Armored Gears and Pinions"

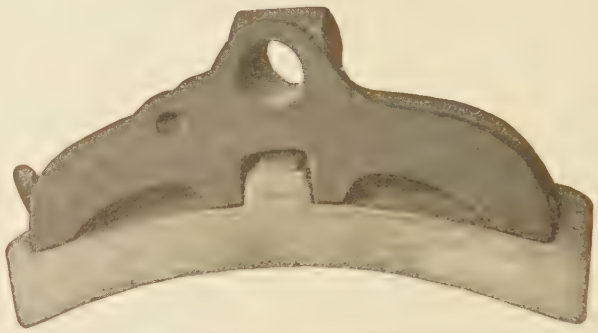
which will prove to you their economy.

Over ⅛ of an inch of hardened steel that will resist the test of a file, backed up by a toughened, elastic body that receives and carries the heaviest shocks without breakage. Write us for particulars.

BLISS E. W. Bliss Co. BLISS

Brooklyn, N. Y.

Down with operating expense!



A. E. R. A. Standard Brake Shoe and Head for McGuire Single Truck

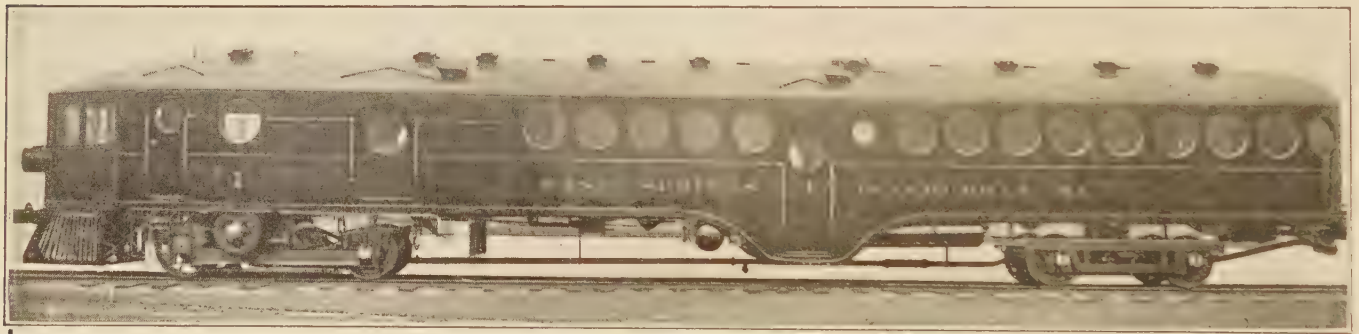
Bringing down brake shoe costs helps. Adoption of the standards is the way to minimize brake shoe costs. We have patterns for the standard shoes and for standard heads to fit any truck. All these heads take the same pattern shoe, making it unnecessary for any road to use more than two patterns of shoe—one for wide treads, one for narrow.

Our engineers are ready to go into the matter with you. Shall they do so?

American Brake Shoe & Foundry Co.

MAHWAH, N. J.

Hudson Terminal Bldg., 30 Church St., NEW YORK. McCormick Bldg., CHICAGO



All-Steel Self-Propelled Gasoline Motor Car FOR INTERURBAN ROADS

124 McKeen Motor Cars now in service in United States, Mexico and Australia

McKEEN MOTOR CAR CO., Principal Office and Works, Omaha, Neb.

Dist. Sales Offices: Eastern, S. D. Barnett, Hudson Term. Bldg., 50 Church St., N. Y.; Central, E. E. Wright, 1451 Marquette Bldg., Chicago, Ill.

Literally "Tool Steel"

"TOOL STEEL"

BEST by TEST

GUARANTEED GEARS and PINIONS

"specially hardened and toughened"

Tool Steel Gear & Pinion Co.

Cincinnati, Ohio 5

LYON

SHEET STEEL GEAR CASES

(Patented)

QUICK DELIVERIES PRICES RIGHT

SAMPLES GLADLY SUBMITTED

LYON METALLIC MANUFACTURING CO.

Chicago Aurora, Ill. New York

GEARS AND PINIONS

Of the GUARANTEED kind only

We solicit your business on the basis of good workmanship, prompt deliveries and attractive prices.

VAN DORN & DUTTON CO., Cleveland, O.

Specify DYMND Quality Fibre

FIBRE GEARS

MILLED & MACHINED SPECIALTIES

Diamond State Fibre Co. Bridgeport, Pa.

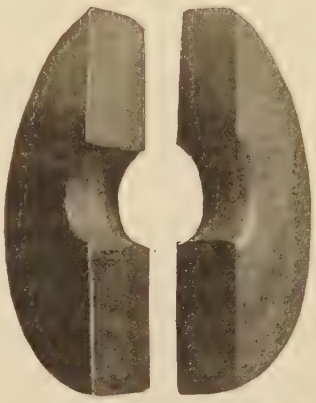
⚓S⚓ BRAND

QUALITY vs. PRICE

No. 5

Blank for Standard Forged and Rolled Steel Wheel

THE illustrations show the "Standard" ingot, or cut portion of long ingot, reduced under powerful presses to the wheel blank. It will be apparent that the outside of the ingot will become the



periphery of the wheel, and that the center, or core of the ingot which is the weakest portion and may contain any slight imperfections, is removed to become the bore of the wheel. The center line of the ingot is coincident with the center line of the hub. The kneading or working the ingot by this process further reduces the size of the crystals of the steel.

¶ The advantage of this method is self evident as compared with a wheel made from ingots rolled longitudinally into slabs and then cut in blanks. This process stretches the steel and permits the portions of the slab, which are torn and checked by the shearing process, to be rolled into the wheel. The center or weakest portion of the ingot appears at points diametrically opposite on the tread of the wheel and prevents uniformity at all points.

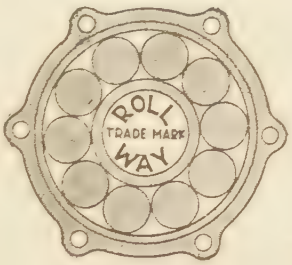
¶ DOES YOUR SPECIFICATION PROHIBIT WHEELS MADE FROM SLABS?

Standard Steel Works Co.

Morris Building, Philadelphia, Pennsylvania

New York, N. Y. Cleveland, O. St. Louis, Mo. San Francisco, Cal. St. Paul, Minn.
Portland, Ore. Richmond, Va. Chicago, Ill. City of Mexico, Mex. Pittsburg, Pa. Denver, Colo.

Steel Tires, Steel Tired Wheels, Solid Forged and Rolled Steel Wheels, Rolled Steel Gear Blanks, Steel and Iron Axles, Steel Springs, Steel and Iron Forgings, Steel and Iron Castings Rolled Steel Rings, Steel Crusher-Rolls and Shells, Steel Pipe Flanges



A Brill-Exide Battery Car with Railway Journal-Boxes.

Rollway Journals have been Adopted as Standard

by the leading Companies manufacturing Storage Battery Cars

They are reliable and give the additional mileage with one charge of the battery essential to commercial success.

Why not secure the same advantages to your Trolley System and operate 25% more cars with your present Power Plant? Durability Guaranteed.

RAILWAY ROLLER BEARING COMPANY, Syracuse, N. Y.

2

Lobdell Car Wheel Company

WILMINGTON, DELAWARE

Established 1836

Solid Steel Car Wheels
Steel Tired Car Wheels
Steel Axles

Chilled Iron Car Wheels
Chilled Iron Pump Plungers

Turntables and Miscellaneous Castings

Griffin Wheel Co.

CHICAGO

Chilled Iron Car Wheels Iron or Steel Axles

BEMIS TRUX

We solicit your inquiries for Car Trucks, Wheels and Axles, Bearings, Springs, Gearing, Castings and Special Machinery.

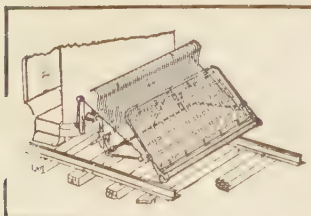
BEMIS CAR TRUCK CO., Springfield, Mass.

CAR WHEELS

FOR ALL CLASSES OF SERVICE

Fitting and Refitting Wheels to Axles a Specialty.

Atlanta Car Wheel & Mfg. Co.
ATLANTA, GA.



ECLIPSE LIFE GUARD

Manufactured by the
ECLIPSE RAILWAY SUPPLY CO.
CLEVELAND, O.

"ROOT SCRAPERS"

Nos. 1, 2, 3, 4 and 5 we carry in stock and can ship any reasonable number on receipt of order. Supplies the same.

THE ROOT SPRING SCRAPER CO., Kalamazoo, Mich.

Marked Savings in Dead Weight and Maintenance

are only two reasons why you should carefully investigate the economies offered by

No Seams

No Welds

The Chillingworth Seamless and Weldless Sheet Steel Gear Case

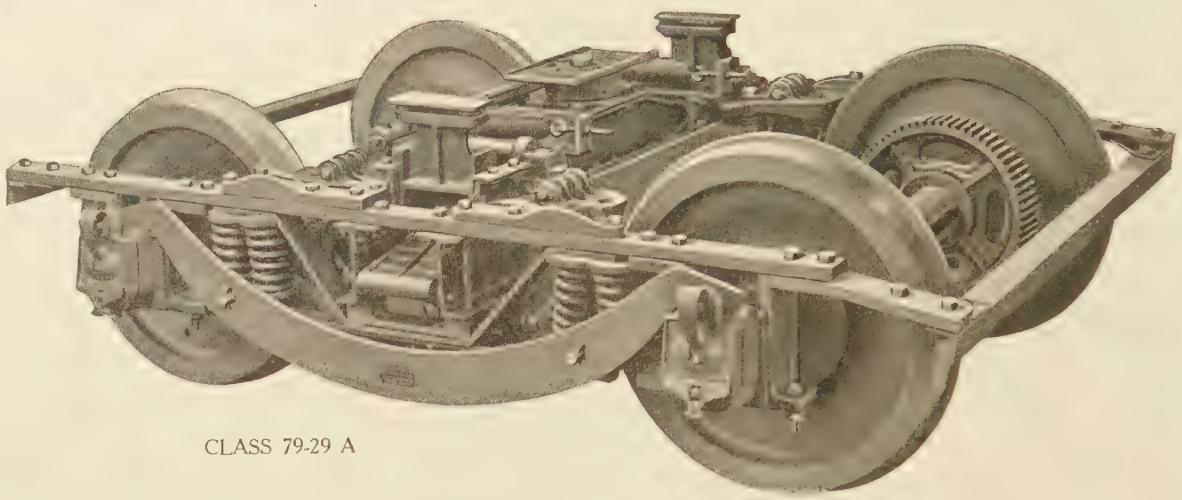
Each half being drawn from one piece of sheet steel there is no danger of leakage as with cases depending upon seams or welds for oil tightness.

The patented construction also offers perfect strength and rigidity—making frequent repairs unnecessary.

If you desire to try out a sample case or wish the details of the successful performance of this case on over 200 European Tramways, write to

Rudolf Chillingworth
West Side Avenue and Carbon Place
Jersey City, N. J.

BALDWIN TYPE "A" TRUCK



CLASS 79-29 A

Gauge, 4′ 8 1-2″.
Service, Interurban high speed passenger.
Wheel-base, 79″.
Center pin load, maximum, 29,000 lbs.
Weight of truck (exclusive of wheels, axles or boxes), 4,590 lbs.

EACH POUND OF TRUCK FRAME WEIGHT CARRIES 6.3 POUNDS OF LOAD.

THE BALDWIN LOCOMOTIVE WORKS
PHILADELPHIA, PA.

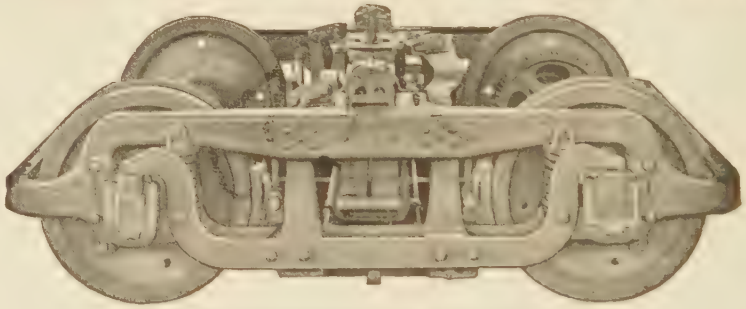
BRANCH OFFICES

New York, N.Y.: Hudson Terminal
St. Louis, Mo.: Wright Bldg.
Richmond, Va.: Travelers Bldg.
Chicago, Ill.: Railway Exchange
Portland, Ore.: Spalding Bldg.

STANDARD C-50-P "LIGHT WEIGHT PRESSED FRAME" DOUBLE TRUCK

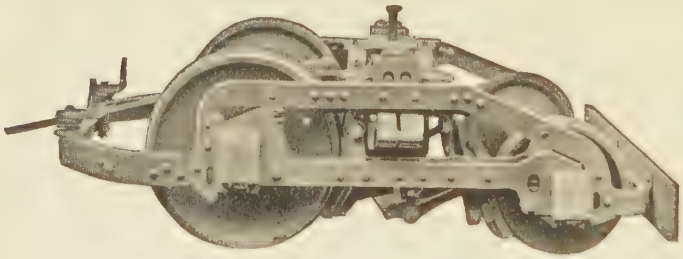
This truck is designed to meet the demands for a Safe and Durable Light Weight, Inside Hung Motor, Double Truck. The Side Frames, End Frames and Transoms are pressed from sheet steel plates into channel-shaped sections, which form gives the lightest practicable weight of metal for the required strength. The Brake Rigging is Solid Forged Steel, same as on all of our trucks. Steel thimbles and case-hardened bolts are used on all wearing parts.

THIS IS THE LIGHTEST WEIGHT TRUCK OF THIS TYPE MANUFACTURED.



C-50 Ratio, Complete Truck to Center Pin Load, 0.273

STANDARD NO. O-36 SINGLE MOTOR, LIGHT WEIGHT MAXIMUM TRACTION DOUBLE TRUCK



O-36 Ratio, Complete Truck to Center Pin Load, 0.255.

This truck is designed to meet the demand for a Light Weight Maximum Traction Double Truck. It weighs 4500 pounds (per truck) with one-wear steel wheels. The Brakes are carried on the Equalizer Bars. The Hangers are of the swing type, having parabolic shaped bearings secured by bolts and compression springs. They are non-chattering. The holes in the levers and brake rigging are steel-thimbled and the bolts are case-hardened. The journals are carefully machined and burnished. The trucks will safely carry car-bodies weighing from 16,000 to 22,000 pounds, with a maximum load at king pins of 36,000 pounds per pair of trucks.

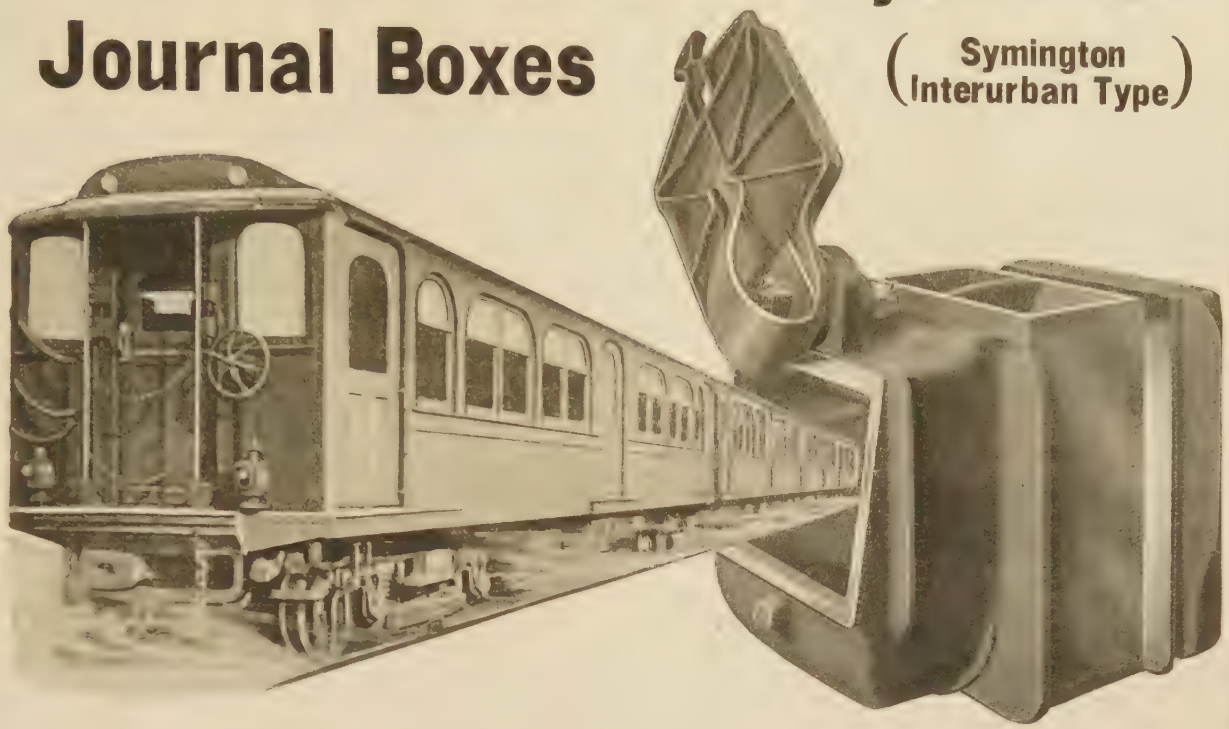
THIS IS THE LIGHTEST WEIGHT TRUCK OF THIS TYPE MANUFACTURED.

"Ask any of the roads using them"

STANDARD MOTOR TRUCK COMPANY, Frick Bldg., PITTSBURGH, PENNSYLVANIA
NEW YORK OFFICE: 170 BROADWAY **WORKS: NEW CASTLE, PA.** (2) **CHICAGO OFFICE: FISHER BUILDING**
Pacific Coast Agents: Eccles & Smith Co., Inc. Offices, San Francisco, Cal.; Los Angeles, Cal.; Portland, Ore.

Go into the subject of Journal Boxes

(Symington Interurban Type)



The deeper you go, the more surely you'll specify

SYMINGTON

The Journal Box is an important truck detail. It directly affects operating and maintenance costs. Symington Boxes are accurately machined in the pedestal ways and on the face of the inside guide lugs. Consequently there is no excessive lateral play. That means materially reduced wheel-flange wear.

Further, the machined lidseat and dependable spring, together with the effective dust guard, make Symington Boxes dustproof—which reduces journal and brass wear and oil consumption.

The lid and spring cannot chatter or jar off in service.

The type shown above is designed for interurban service. There are other types for all conditions.

Symington Service considers each application a separate engineering proposition.

It insures journal boxes that are not merely good, but good on the particular truck for which they were intended.

In ordering trucks, be sure to specify that they shall be equipped with Symington Journal Boxes.

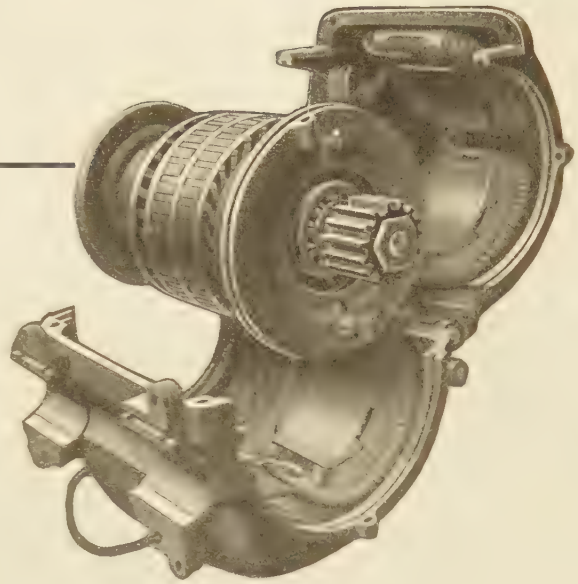
Interesting facts on journal boxes in the Symington Book. A request brings a copy.

THE T. H. SYMINGTON CO.

Maryland Trust Bldg.
BALTIMORE

623 Peoples Gas Bldg.
CHICAGO

New England Agent: James C. Barr, 84 State Street, Boston



Railway Motor with Armature Mounted on HB-DWF Ball Bearings.

Ball Bearings on Railway Armatures

In our last talk attention was paid to the benefits derived by using ball bearings on the shafts of dynamos and motors. These benefits may be summarized as follows; all of them appear in full measure in electric railway work:

Energy saving 3% to 5%
Absence of bearing wear
Reduced air gap
Capacity increased about 20% for same temperature rise of armature
Commutation improved and brush friction reduced.

None of these advantages, however, equals in importance the direct and indirect savings due to **absence of repairs** such as are occasioned by the wear of plain bearings. As the bearings do not wear, the armature is always in the center of its magnetic field, and there is no sparking due to distortion of the field, or abnormal bearing wear due to the same cause. The armature cannot drop on the pole pieces and interrupt traffic while the car is pushed to the barn. It is not necessary to pay interest on idle equipment while bearing repairs are being made; and this saving is to be added to that in the shop itself.

It is a fair statement that the cost of plain bearings on railway motor armatures is made up of their first cost (which is small), plus the cost of periodic refitting, plus the oil they waste, plus the interest on equipment tied up while repairs are being made, plus the cost of whatever traffic delays may be due to break-downs on the road, plus the added 20% for first cost, interest and depreciation on the larger size of motor necessary for equal capacity as compared with a ball bearing motor. On the other hand, the cost of ball bearings is only their first cost, distributed over a life of three hundred thousand miles and upward, plus the cost of semi-annually packing the bearings with grease.

Experience has proved, not once but many times, that a set of Hess-Bright ball bearings may be depended on to run at least three hundred thousand miles. Ordinarily no appreciable wear is shown in that mileage. During all that time absolutely no attention is required save a semi-annual inspection and replenishment of lubricant. So far as the ball bearings are concerned a car might run twenty-four hours a day, 365 days in the year.

An incidental saving due to the use of ball bearings is in the wear of the gear and pinion. As the armature is always in line, the teeth make true contact and run quietly with the minimum of wear.

NOTE—This is the sixth of a series of talks on the development and application of modern ball bearings in electric railways. The next will appear two weeks from this date. If you have mislaid the preceding installments we can furnish reprints.

THE HESS-BRIGHT MANUFACTURING CO.
2126 Fairmount Ave., Philadelphia, Pa.

HESS-BRIGHT BALL BEARINGS

On Main Journals Unworn After $3\frac{1}{2}$ Years— Approximately 150,000 Miles

BALL BEARING INTERURBAN CAR
ATLANTIC CITY & SHORE R.R.

G. M. B.

TELEPHONE—CHARTER 2854. No. 141 WASHINGTON STREET HARTFORD, CONN., April 4,1912

The Hess-Bright Manufacturing Company,
Philadelphia, Pa.

Gentlemen:- I submit herewith a summarized report, giving briefly the results obtained in the measurement of two Hess-Bright Ball Bearings, No.7322, Railway Type, sent me for this purpose, the complete report of the investigation having been made March 20, 1912.

Bearing No.1,

The mean, or average, Radial Freedom was found to be 0.000046 in. -practically nil.-

The mean End Play 0.00125 in.

The mean, or average, Eccentricity of Inner Race was found to be only 0.00004 in.-also practically nil.

Bearing No.2,

The mean Radial Freedom for this bearing was found to be 0.0003 in.,

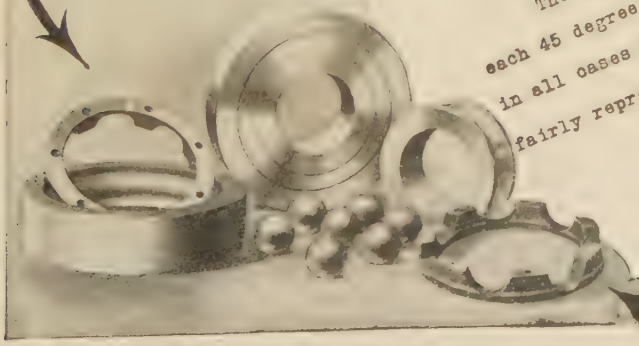
The mean, or average, End Play 0.0097 in.

The mean, or average, Eccentricity of Inner Race 0.00025 in.

The averages above given are those of readings for each, taken at each 45 degree division of the circle. The maximum and minimum readings in all cases being so nearly alike, practically, that the resulting averages fairly represent the condition of these bearings at the time of the test.

Very truly yours,

Geo. M. Bond.



The bearings above referred to were taken from a single journal box of the interurban trolley car above shown. They had been in constant service since October, 1908, with no attention save to repack with grease every 10 to 12 months. Bearing No. 2 carried end thrust in addition to the weight on the axle. These bearings were put back in service after the test.

CAMBRIA
Coffin Process Axles
(Annealed—Toughened)

Cars Shapes
RAILS
(Standard Sections in Stock)
Plates Bars

Cambria Steel Company, JOHNSTOWN, PA.

Sales Offices:

ATLANTA
BOSTON
BUFFALO
CHICAGO
CINCINNATI
CLEVELAND
NEW YORK
PHILADELPHIA
PITTSBURGH
SAN FRANCISCO
ST. LOUIS
TACOMA

HEAT TREATED AXLES

The heavier loads and especially severe conditions of modern electric service, which are constantly increasing, demand the use of axles of a quality to assure safety with economy of operation particularly where their size is limited by present equipment. To meet these conditions we offer

Carnegie Annealed Axles
Carnegie Toughened Axles
Carnegie High Test Axles

Our illustrated pamphlet containing Standard Specifications, may be had on request.

CARNEGIE STEEL COMPANY
General Offices, PITTSBURGH, PA.

Attractive and Convenient Transportation Increases Traffic

Electric railways are naturally interested in promoting the growth of traffic.

Various advertising expedients are resorted to. Faster schedules, and every precaution to insure safe and speedy transit are introduced. All of which are extremely desirable.

But there is another method which may be adopted with great advantage. That is, attractive and convenient transportation.

And that can best be secured by *anticipating* in the *construction* of your cars.

This method of car construction is one of the salient points characterizing the McGuire-Cummings car-building standard.

This company does not wait until the car is on the line and the road has an opportunity to wish there had been a slight change here, or a slight modification there.

We ascertain *in advance* by co-operation with the purchaser, and careful analysis of the traffic conditions, just what will best conduce toward the most attractive and convenient transportation for all classes of traffic, and we then build the cars accordingly.

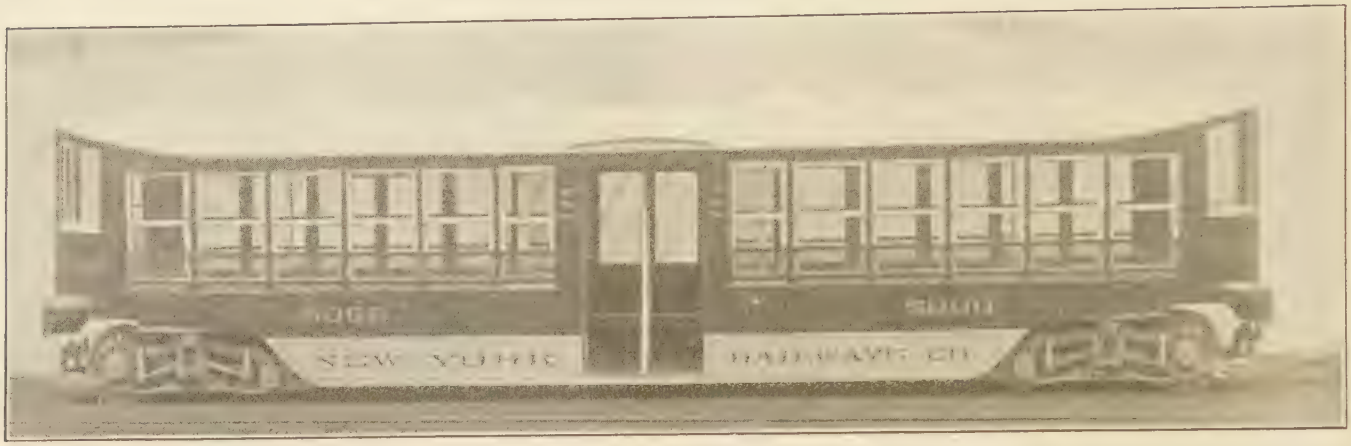
Perhaps we may be in position to suggest some such added features for your next lot of rolling stock.

We shall welcome the opportunity of conferring with you.

McGuire-Cummings Mfg. Co.

Builders of City and Interurban Cars and Trucks

Harris Trust Bldg., Chicago, Ill.



Stepless Car No. 5,000, Built by The J. G. Brill Co., Philadelphia

Setting the Pace in Car Design

The original Prepayment Cars revolutionized car design five years ago.

Modifications to suit various traffic conditions have adapted it to the needs of some 140 roads.

Its latest modification applies the Prepayment principle to the Stepless Center Entrance Car.

The Prepayment Car Sales Company owns or controls the cars, and grants a license to Car Builders and Railway

Prepayment Car

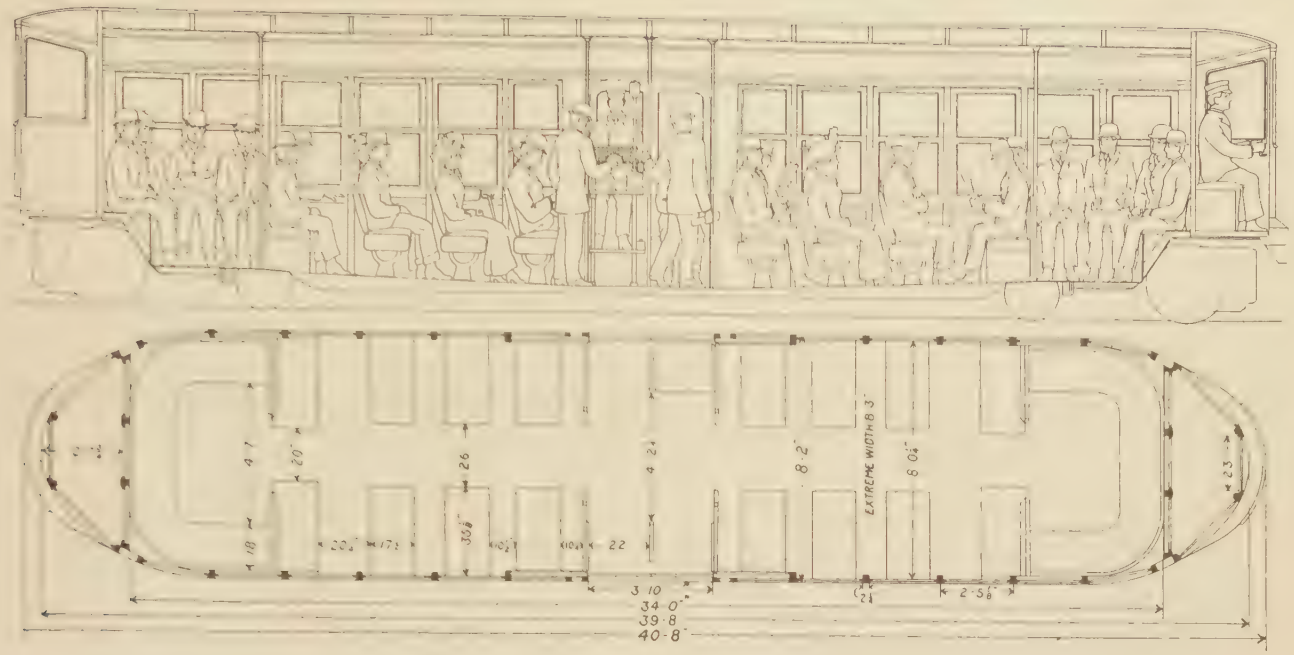
CHICAGO:
417 So. Dearborn St.

Principal Office: 50

Sole Lic

THE PAY-AS-YOU-ENTER CAR CORPORATION

ELECTRIC SERVICE SUPPLIES COM



The Stepless Prepayment Car

has been so successful in New York, that after two months of rigid observation of the car in constant service, it has been decided to build immediately 150 more cars of the same type.

This car with its low 10-inch elevation from street to car floor, and its bright, comfortable interior goes far in further enhancing the good will of the roads' patrons, besides conserving the other valuable Prepayment features—safety, reduced running time and increased collections.

patents which cover all forms of practical fare prepayment Companies for the building and operation of such cars.

Sales Company

Church St., New York

PHILADELPHIA:
17th and Cambria Sts.

nsor for

THE PAY-WITHIN CAR COMPANY

PANY, GENERAL SALES AGENT

Pressed Steel Car Co.

STEEL PASSENGER CARS

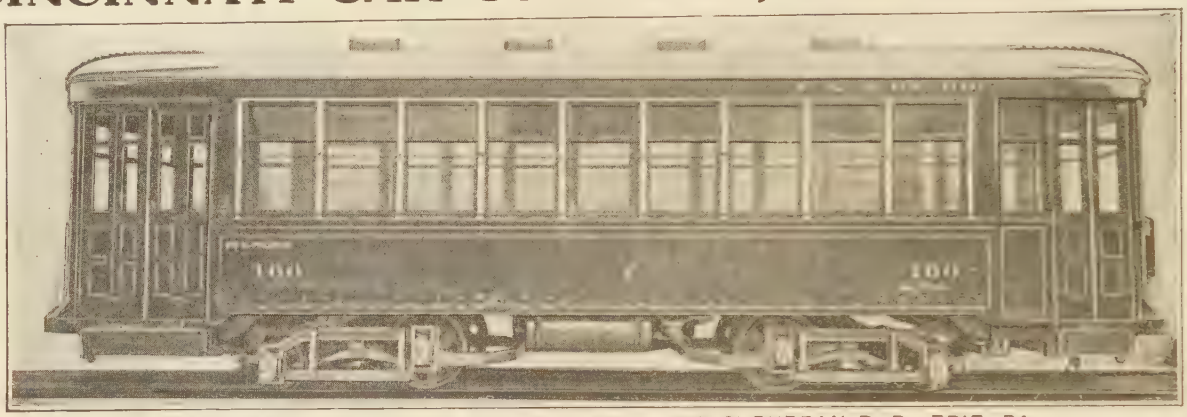
For

Steam & Electric Railways

Indestructible **Fireproof**

Offices—New York, Pittsburgh, Chicago, Washington, D. C.

CINCINNATI CAR COMPANY, Cincinnati, Ohio



PREPAYMENT CAR, BUILT FOR THE ERIE AND SUBURBAN R. R., ERIE, PA.

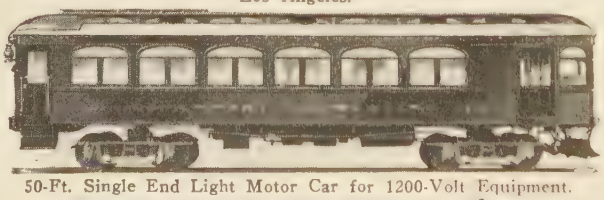
44 Ft. Light 2 Compartment Interurban Motor Car.

50-Ft. Light, Inexpensive Trailer of Great Capacity.

These cars and many more are described in detail in our catalog. Prices and prompt delivery can be made on duplicates or with any exceptions desired.

NILES

CAR & MFG. CO., Niles, O.
General Sales Offices, 312 Electric Bldg., Cleveland.
Pacific Coast Agents, Eccles & Smith Co., San Francisco, Portland, Los Angeles.



50-Ft. Single End Light Motor Car for 1200-Volt Equipment.

Double End Express, Baggage and Freight Motor Car.

Elliptical and Helical Springs and Steel Tired Wheels for Electric Railway Service

Railway Steel-Spring Co.

General Office:
30 CHURCH ST., NEW YORK

Chicago St. Paul | St. Louis Louisville | Washington Detroit

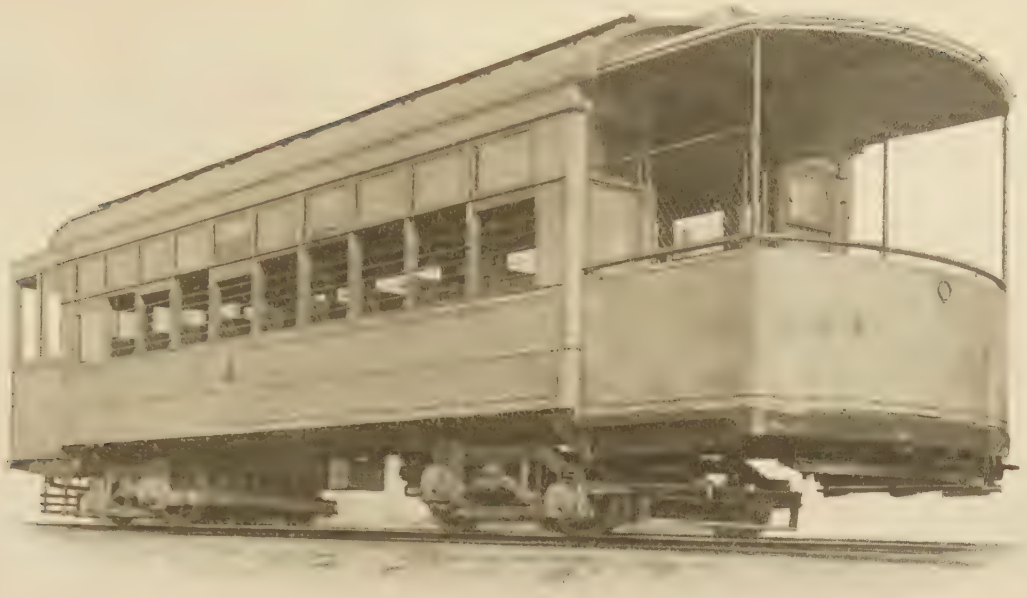
UNION SPRING & MANUFACTURING CO.

SPRINGS COIL AND ELLIPTIC
M. C. B. Pressed Steel Journal Box Lids

General Office, Oliver Bldg., PITTSBURGH, PA.
Works: New Kensington, Pa.
50 Church Street, New York — 1204 Fisher Bldg., Chicago, Ill.
Missouri Trust Bldg., St. Louis, Mo.

PECKHAM TRUCK PARTS

E. G. LONG CO.
50 Church St.,
N. Y.



A radical departure in car construction which saved 7 tons weight and forestalled dry rot

This car illustrates what advanc d design and perfect construction can do toward overcoming causes of serious car deterioration and high maintenance expense.

This design is the Stone & Webster Engineering Corporation's semi-steel double-truck, arched-proof city car with 26-ft. 6-in. body, seating capacity forty; total weight 12,500 lb.

The car was designed primarily to run in the South where the maintenance expense was high, owing to the necessity of rebuilding every two or three years because of the dry rotting of the ash posts.

When oak as a substitute for ash failed to prove much better, a departure in design was made. Semi-steel T-posts and carlines built in one piece from sill to sill were tried. The result has been a tremendous success—so much so that we have built seventy-two cars of this construction and now have forty-three more under way.

Among the particular advantages are long life—20 to 25 years being predicted—as compared with two or three years—lightness in weight, the saving being seven tons per car; a gain of 10 inches in interior width between the linings of the car; greater strength and greater resiliency.

The above is but one of the many examples illustrating our facilities for producing perfect car construction based on *any* suggested design.

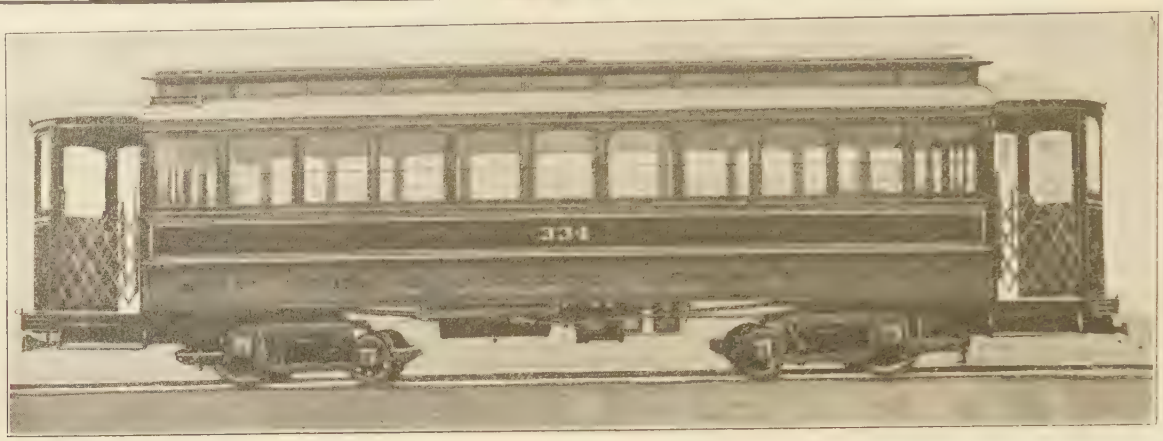
St. Louis Car Company, St. Louis

Electric and Steam Railway Coaches, Steel Cars, Trucks, Journal Bearings
Curtains, Seats, Rattan, Bronze Trimmings, Miscellaneous Car Supplies.

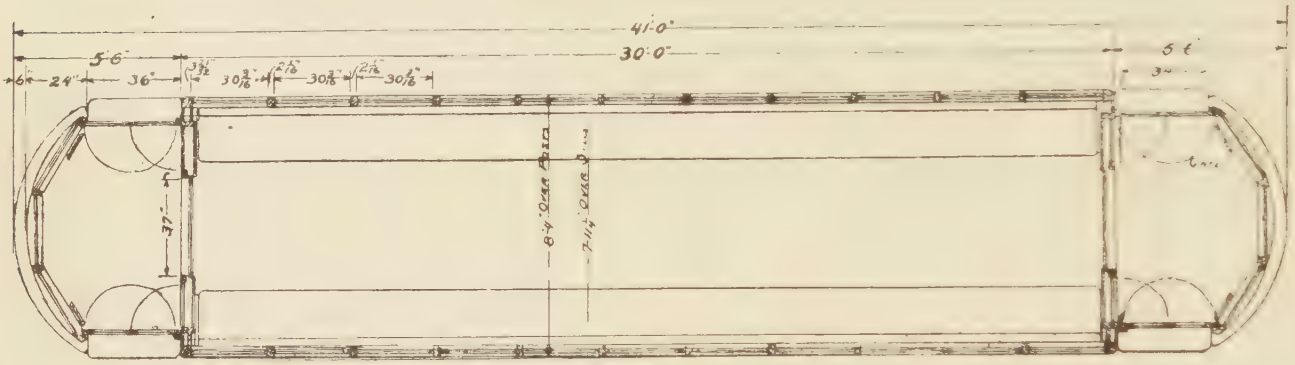
Eastern Representative:
WENDELL & MacDUFFIE CO.
165 Broadway, NEW YORK

Pacific Coast Representative:
GUS KOCH
797 Monadnock Bldg., San Francisco

Jewett Car Bulletin



ONE OF 36 CARS NEW YORK & QUEENS COUNTY, LONG ISLAND CITY, N. Y.



REPEAT ORDERS

Repeat orders are always conclusive evidence of satisfaction.

The floor plan and exterior view of the car illustrated represent one of 36 Jewett cars for the New York & Queens County Railway Co., Long Island City, New York, their first order for 25 cars having been immediately followed by an order for eleven more of the same type.

By proper designing a very great deal of unnecessary weight, which costs the road good money to haul around, was eliminated from the last two lots of cars we have built for this road.

The cars are of all wood construction of the lightest possible design consistent with Jewett standards for the greatest strength with the least weight.

From the details of the results we have accomplished for other roads you may be able to find some money-saving suggestions.

Let us mail you some of these details.

The Jewett Car Company

Newark, Ohio

One Man Operation

practicable only on Beach cars with Edison batteries, has made a decided saving for the Charlotte Rapid Transit Company. This is possible where the cars operate on night service or extensions to the city service where traffic is light.

No conductor. Passengers enter and leave at operating end. Fare Box at entrance. Road mostly grades, up to 6.2%.

Average power consumption 540 watt hours car mile, battery output.
These cars average 130 miles per car per day.

Charlotte Rapid Transit Co., Charlotte, N. C.

Beach Car WITH THE Edison Battery

is particularly adapted to extensions to city service—night service or rush hour service, showing great economy in operation as compared with the trolley.

The power bills are low, the maintenance cost extremely small and the car is reliable.

The Edison Battery is guaranteed to maintain its original capacity for four years irrespective of mileage obtained.

All the maintenance required is to keep the battery cells filled with pure water and renew alkaline solution entirely every 9 or 10 months—costs $0.002 per car mile.

Let us give you the facts of storage battery car costs—taken from actual service operation.

Railway Storage Battery Car Co.

Exclusive Agents

30 Broad St., New York City

Federal Storage Battery Car Co.

Manufacturers

Don't Fail To Consider

Storage Battery Cars

For New Lines, Extensions or Equipment

If you are considering the construction of a new electric railway line, extensions to your present line or are increasing your equipment it may be that storage battery operated cars will fill the requirements of your service better than those operated by trolley or third rail.

In cases where traffic is of comparatively low density or the service desired is infrequent, storage battery cars equipped with

"Hycap-Exide" Batteries

have many distinct and important advantages.

In the first place, the initial investment required by storage battery cars is small and again the maintenance expense is low. Any reasonable requirements as to speed, grades, low power consumption, great mileage without stopping for recharge, quick charging ability and large total daily mileage capacity can be met by storage battery cars.

The reliability and economy of battery cars have been well proven by The Third Avenue Railway Company of New York City. This company has been operating battery cars since February, 1910, now having in operation 51 cars equipped with "Hycap-Exide" Batteries.

Our data and experience are at your service. Send for a copy of our new bulletin No. 136.

The "Hycap-Exide" Battery is the standard equipment for the battery cars manufactured by The J. G. Brill Co.

THE ELECTRIC STORAGE BATTERY CO.

Manufacturer of

The "Chloride Accumulator" The "Tudor Accumulator"

The "Exide", "Hycap-Exide", "Thin-Exide" and "Ironclad-Exide" Batteries

New York Boston Chicago **PHILADELPHIA, PA.** Denver San Francisco Seattle
St. Louis Cleveland Atlanta Detroit 1888-1912 Los Angeles Portland, Ore. Toronto

BRILL CITY AND INTERURBAN CARS AND TRUCKS BRILL

The Right Car for Storage Battery Operation

THE above car is correct in design, materials and construction according to the established standards of street railway car building. There is nothing experimental about it and it can be relied on to stand up under heavy service and have long life and low maintenance charges. The same is true of the truck which is built of commercial shapes. This type of car body and its arrangement of seats, windows and doors provides all the features necessary to produce the highest results in any of the various classes of service for which the storage battery car is intended. The placing of the "Hycap-Exide" battery under the seats has no objectionable features, as there is no possibility of the fluid getting out of the cells and there are no fumes nor odors. We furnish these cars complete and ready for operation.

See opposite page

THE J. G. BRILL COMPANY
Philadelphia, Pa.

AMERICAN CAR COMPANY
St. Louis, Mo.

JOHN STEPHENSON COMPANY
Elizabeth, N. J.

G. C. KUHLMAN COMPANY
Cleveland, Ohio

WASON MANUFACTURING COMPANY
Springfield, Mass.

COMPAGNIE J. G. BRILL
Paris, France

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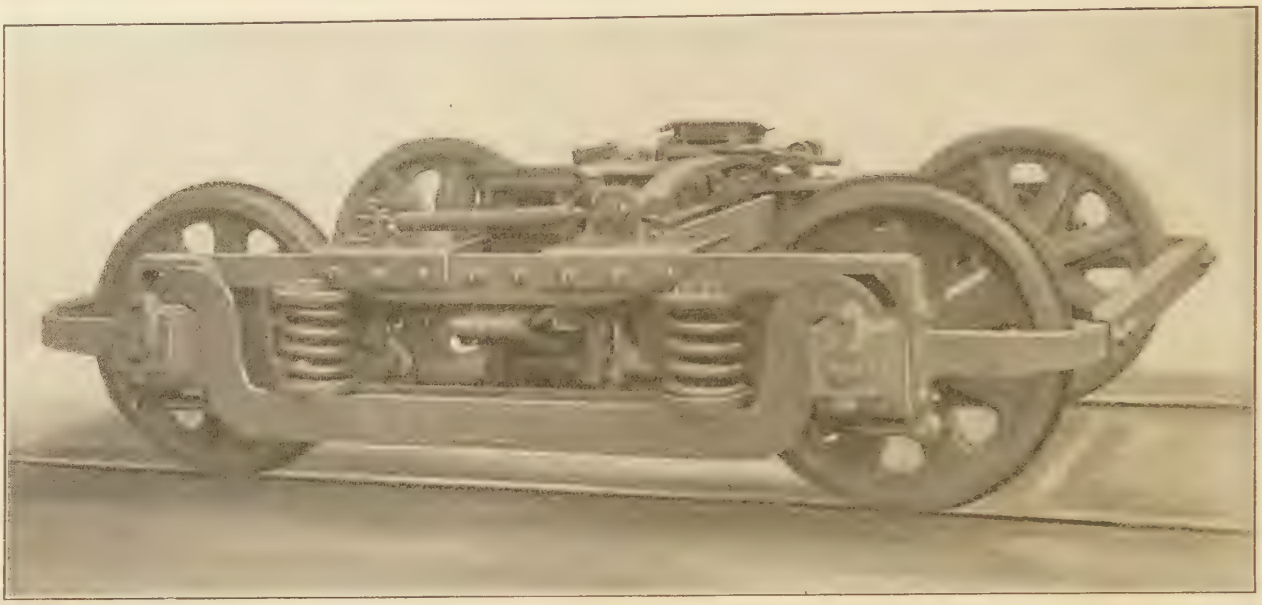
BRILL SEATS:SPRINGS:SPECIALTIES:SUPPLIES BRILL



Brill No. 27 M. C. B. Truck

THIS truck, which is the Brill standard for high speed service, has the "Master Car Builder's" method of equalization and Brill solid forged side frames. The one-piece solid forged side frames are a fundamental feature of the truck, as they provide the greatest strength where it is most needed and make possible a transom, pedestal tie bar and end frame construction, which insures permanent squareness and rigidity to the entire frame. Accessibility of the brake parts is an important feature secured by this frame; another is the very considerable reduction in the number of parts of the truck. The bolster is made of a single steel casting. The truck is made for four sizes of journal, viz., 3¾ by 7, 4¼ by 8, 5 by 9 and 5½ by 10. It has been adopted by 67 of the foremost railway companies.

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BRILL CITY AND INTERURBAN CARS AND TRUCKS BRILL

The Hedley-Doyle Stepless Car

THE very apparent advantages of the Stepless car—safety, speed of loading and unloading, large seating capacity, increased efficiency of the crew, minimum dead load per passenger—and the conditions under which the car has been tested, have produced a wide-spread conviction that it is a type which must soon have a large place in city railway practice. While it is the most radical type that has ever been put in street railway service, it is applicable to any street railway. We are ready to take up the subject with those who believe that their lines have features which make its use impracticable from an engineering standpoint. We are the builders of Stepless cars under the Hedley-Doyle designs and patents which are controlled by the Prepayment Car Sales Company.

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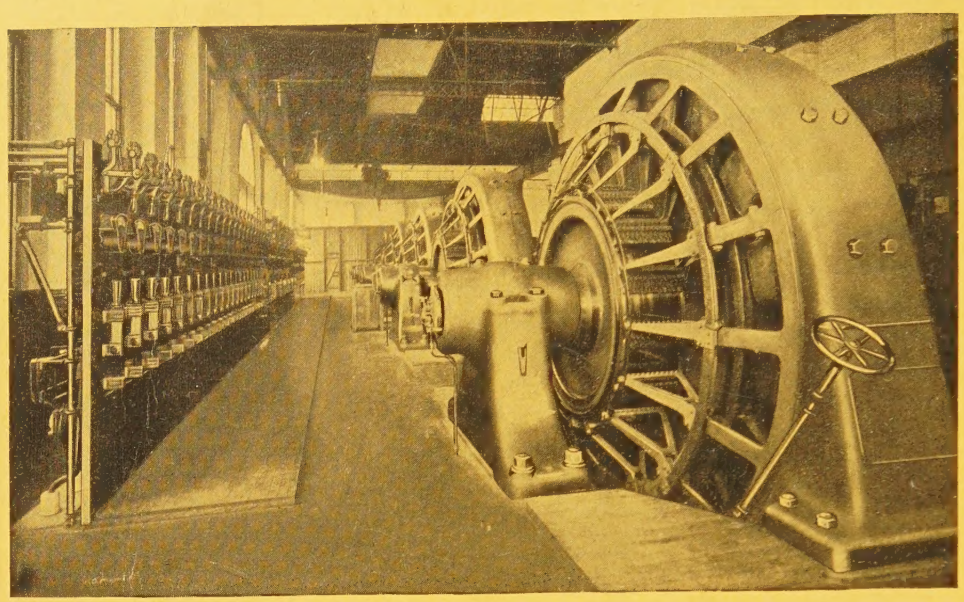

The Value of Overload Capacity

in a Rotary Converter Installation is represented by the following records of output of G-E Rotaries at the Jefferson and Van Buren streets (No. 1) and the Lill Avenue substations (No. 3) of the Chicago Railways Co. for the month of January:

	Substation No. 1	Substation No. 3
Rotaries in operation	Six 2000 kw.	Three 2000 kw.
Full rated capacity 24 hours	287,971 kw-hrs.	143,985 kw-hrs.
Registered for one day	223,800 kw-hrs.	119,000 kw-hrs.
Load factor	.78	.83
Rated ampere capacity	19,998 amperes	9,999 amperes
Average two hour peak load	29,000 amperes	11,000 amperes
Maximum ten minute load	33,000 amperes	15,600 amperes

The rotaries in substation No. 1 carry the heavy fluctuating loads of the down town district in Chicago—a service requiring absolute reliability under conditions of exceptional severity.

Loads similar to those indicated have been carried throughout the winter months with absolute reliability and no repair expense.

This ability to carry overloads is a feature which has characterized G-E Rotaries ever since their first introduction to the railway industry—it means low maintenance, maximum all-day efficiency and perfect reliability when most needed.

General Electric Company

Largest Electrical Manufacturer in the World

Principal Office:
Schenectady, N. Y.

Sales Offices in all Large Cities.

3579